

AMERICAN JOURNAL OF PUBLIC HEALTH *and* THE NATION'S HEALTH

VOLUME 31, 1941

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Volume 31

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Number 7

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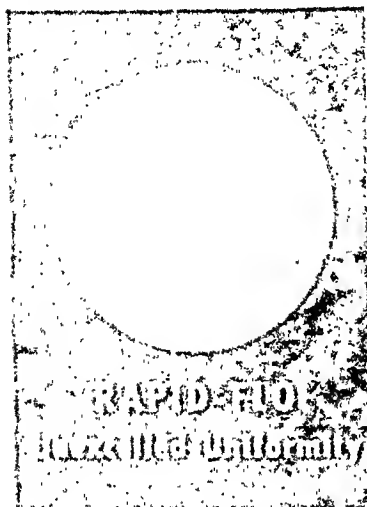
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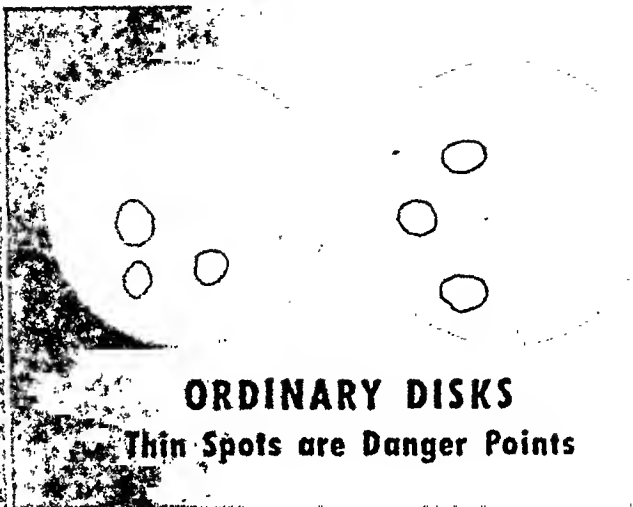
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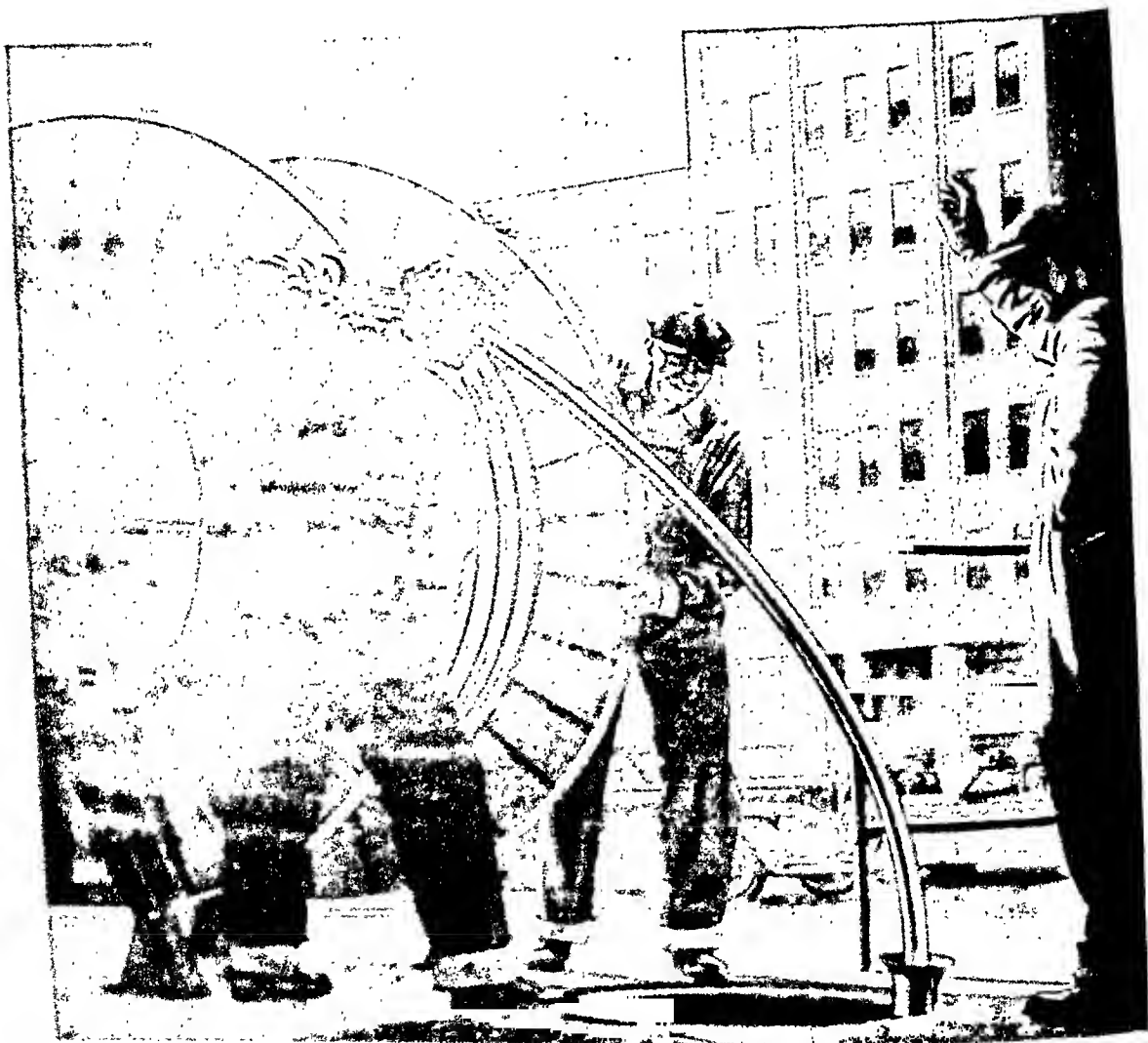
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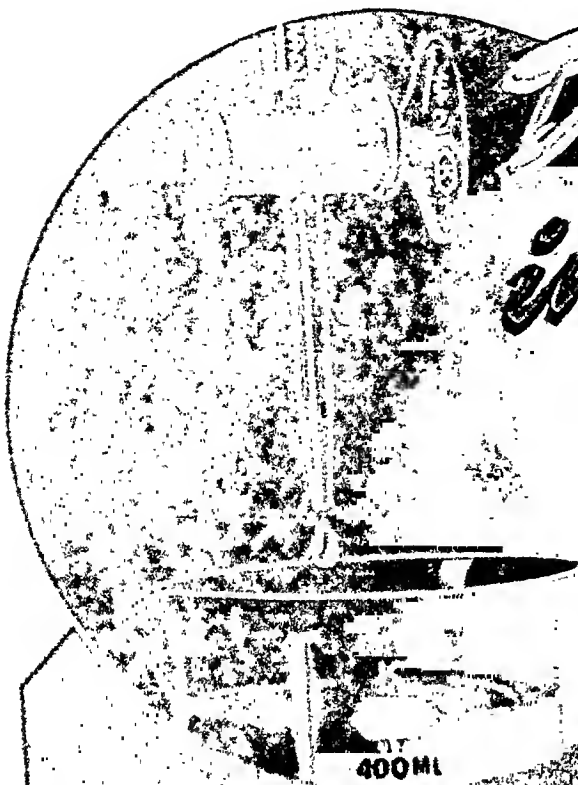


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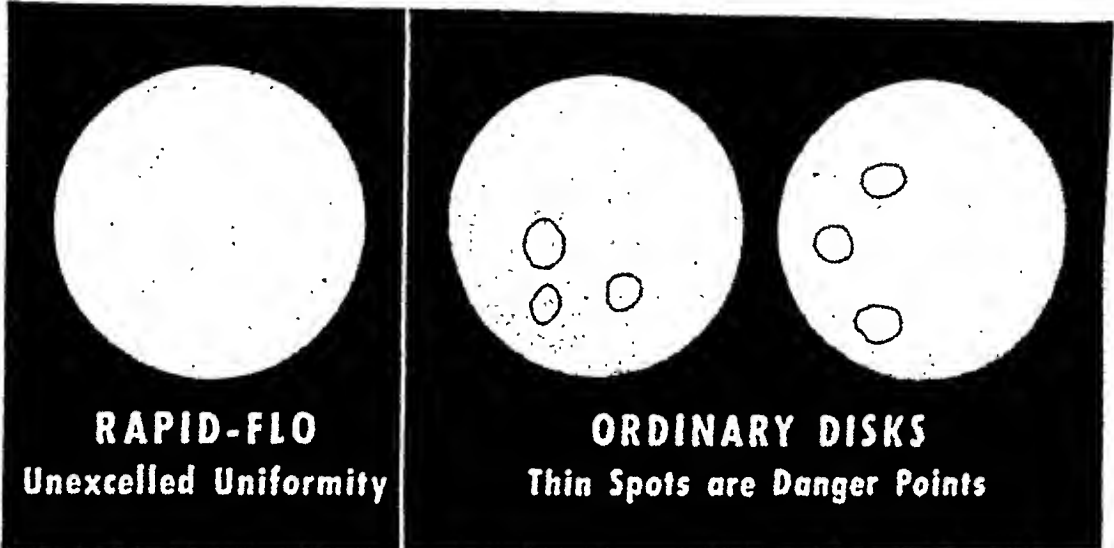
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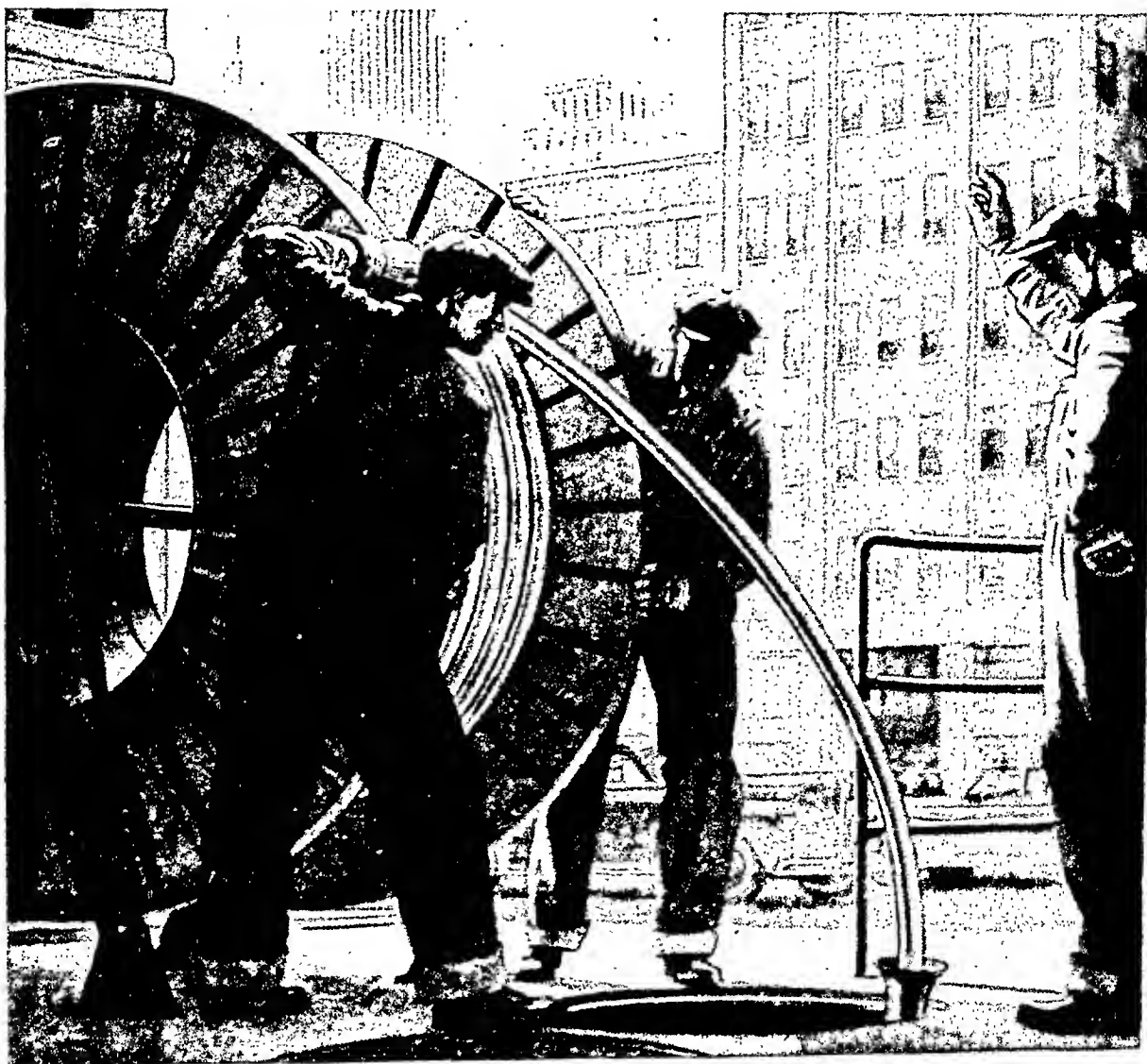
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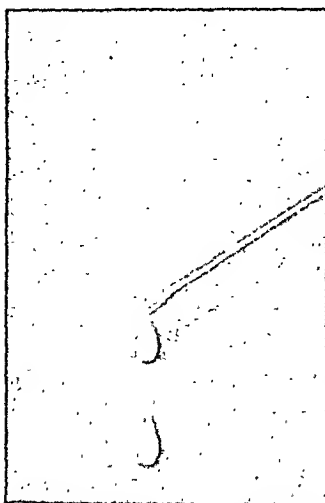
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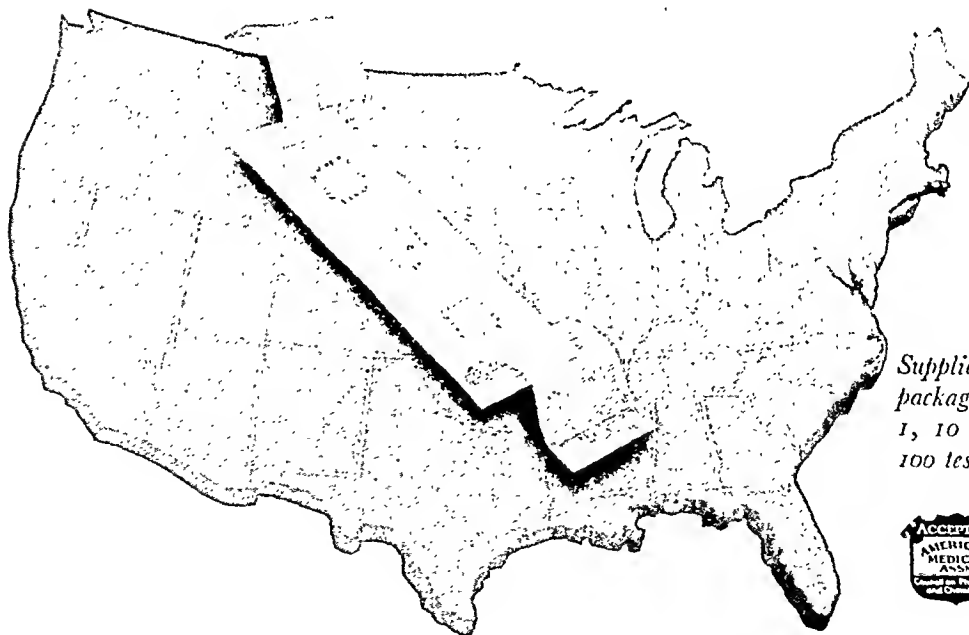
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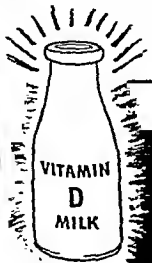
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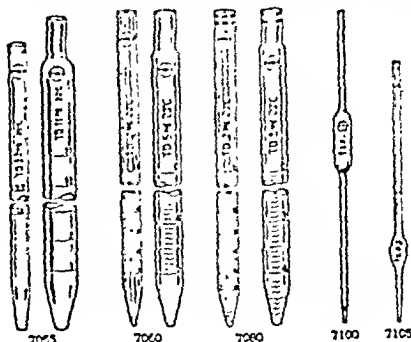
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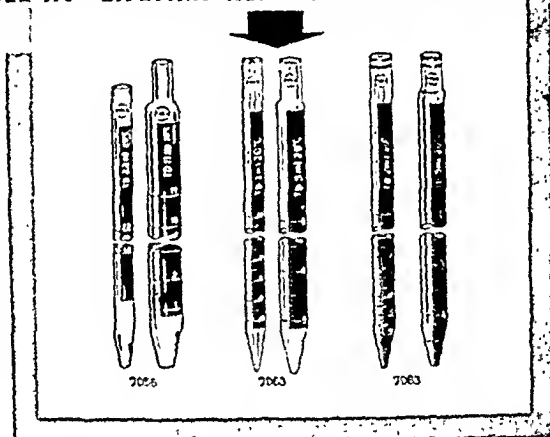
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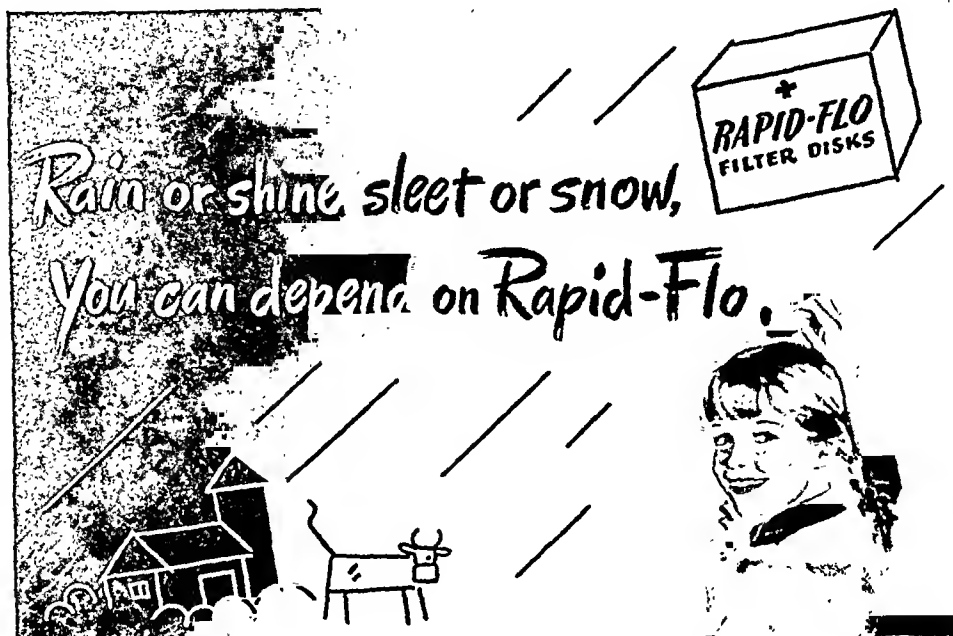
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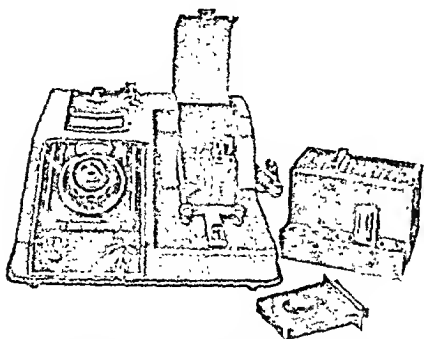
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American Journal of Public Health

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Volume 31

July, 1941

Number 7

Composition of Diesel Engine Exhaust Gas*

H. H. SCHRENK, PH.D., F.A.P.H.A., AND L. B. BERGER

Chief Chemist, Health Division, Bureau of Mines; and Associate Chemist, Gas and Dust Section, Central Experiment Station, Bureau of Mines, Pittsburgh, Pa.

PROBLEMS requiring the assistance of industrial hygienists have been associated with virtually every major industrial advancement. The automobile introduced many industrial hygiene problems not only in its manufacture but also in fields associated with its use, such as the ventilation of vehicular tunnels and the production and utilization of gasoline and lead tetraethyl. Mechanical refrigeration was accompanied by hazards from toxic gases and vapors. Innumerable examples could be given, but the above are enough to indicate the significant rôle of the industrial hygienist in our industrial progress. It is becoming more and more an accepted policy of industry that the effects of new products and developments on the workers and users

should be known before their widespread application.

It has been suggested that Diesel engines could be used safely underground, based upon a comparison with gasoline engines, and assuming that (1) the carbon monoxide content of the Diesel exhaust is always low, and that (2) fire and explosion hazards from Diesel fuel are minimized because of its low volatility. In these respects Diesel engines appear less hazardous than gasoline engines whose use underground has been discouraged by the Bureau of Mines and other organizations interested in safety and mining. Therefore, owing to the increased interest in the possible use of Diesel engines as the source of power for haulage equipment in mines and tunnels in this country, and in line with the policy of studying the hazards associated with new developments and applications, the Bureau of Mines has initiated a study of the hazards involved in the use of Diesel engines underground.

* Contribution from the Central Experiment Station, Bureau of Mines, Pittsburgh, Pa.

Published by permission of the Director, Bureau of Mines, U. S. Department of the Interior, Washington, D. C.

Read at a Joint Session of the Engineering and Industrial Hygiene Sections of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

The main phase of this study to date has dealt with the composition of the exhaust gas, knowledge of which is essential to the safe use of Diesel engines underground or in confined spaces. Such information also may be valuable in establishing a basis for the ventilation of vehicular tunnels, as the requirements for Diesel engines may differ from those of gasoline engines. This paper does not include information based upon underground use.

COMPARISON OF OPERATING PRINCIPLES OF GASOLINE AND DIESEL ENGINES

Before proceeding with presentation of the details of this investigation it may be well to consider some of the basic differences in the operating principles of gasoline engines and Diesel engines:

In conventional gasoline engines, equipped with carburetor and spark-ignition, the fuel is atomized, vaporized, and mixed with air in the carburetor. The gasoline-air mixture is then drawn into the cylinders, compressed, and ignited by an electric spark. The power output of the engine is regulated by the quantity of this mixture admitted to the cylinders through a throttling

device interposed between the carburetor and the cylinders.

In the Diesel, or compression-ignition engine, fuel and air are mixed directly in the cylinders. An essentially constant volume of air is drawn into the cylinders and compressed. Near the end of the compression stroke, fuel under high pressure is sprayed into the air, which, because it has been compressed, is at high enough temperature to cause spontaneous ignition of the fuel. The power output of Diesel engines is controlled by regulation of the quantity of fuel injected into the cylinders by a fuel pump capable of delivering varying quantities of fuel at high pressure.

It is evident that the ratio of fuel to air in the mixture supplied to the gasoline engine must be restricted to proportions that are within the inflammable or explosive limits of gasoline-air mixtures. The range of ratios of fuel to air within which a gasoline engine operates is therefore limited as compared to the fuel-air ratios obtained in Diesel engines, where air supply is essentially constant and fuel quantity is varied to meet power-output demand.

Furthermore, to obtain satisfactory

TABLE 1
Description of Engines Tested

<i>Designation of engine</i>	<i>A</i>	<i>B</i>
Type	4-stroke cycle	4-stroke cycle
Number of cylinders.....	4	4
Cylinder bore inches	4½	4
Piston stroke inches	5½	4½
Piston displacement cubic inches	312.1	226.2
Maximum rated speed r.p.m.	1,400	2,600
Maximum rated brake horse power (without accessories)	44	70
Fuel pump	Individual pump for each cylinder; fuel delivery controlled by pump plunger by-pass	Individual pump for each cylinder; fuel delivery controlled by pump plunger by-pass
Type of injection valve	Single-hole orifice; flat-faced valve seat	Circumferential orifice (pintle nozzle); conical valve seat
Opening pressure of injection valve discharging into air at atmospheric pressure lb. per sq. in.	1,500	1,650
Combustion system	Cylindrical precombustion chamber with cone-shaped ends	Spherical turbulence or air-swirl chamber
Cooling system	Positive circulation, thermostatically controlled	Positive circulation, thermostatically controlled

performance with gasoline engines, the fuel-air ratio is adjusted so that there is too little air in the mixture for complete combustion of the fuel, thus producing considerable quantities of carbon monoxide. In contrast, Diesel engines can be operated at fuel-air ratios such that an excess of air is always present, and combustion proceeds much more nearly toward completeness.

TEST EQUIPMENT AND PROCEDURE
Engines and Dynamometer

Two standard, commercial Diesel engines have been tested. Each was mounted in a "power unit," including radiator, fan, clutch, fuel system, and starting mechanism. Each unit was coupled to an electric dynamometer to permit operation at various speeds and power outputs. The engines, designated "A" and "B," are described in Table 1.

The engines were adjusted in accordance with the recommendations of the manufacturers, except in the tests in which the adjustment of the fuel pump was altered to permit an increase in fuel injection. The report does not include data on the effect of such factors as excessive wear, improper atomization of fuel, or other maladjustments that might have significant effects on the composition of the exhaust gas.

Fuel

The chemical and physical properties of the fuel were as follows:

Flash point (P.M.C.C.)...° F.	Above 200
Water and sediment.....	Trace
Viscosity, S.U. at 100° F. sec.	48
Carbon residuc	Trace
Ash	do
Gravity	°A.P.I. 38.8
Pour point (upper).....° F.	50
Cetane number (knockmeter delay method)	78
Sulfur	per cent Trace
Hydrogen	do 14.0
Carbon	do 86.0
Nitrogen	do 0
B.t.u. per lb.....	19,910

Test Procedure

The engines were new when received and were run for 100 hours at various speeds and loads before any tests were made. For each test the engine was operated for 1 hour at the desired speed and load conditions. During the last 15 minutes of this period samples of exhaust gas were collected, and a final measurement was made of fuel consumption.

Gas Sampling and Analysis

Constituents of Diesel exhaust gas that may create harmful or objectionable atmospheres are carbon monoxide, oxides of nitrogen, carbon dioxide, aldehydes, soot, and oxides of sulfur (if the fuel contains sulfur). The exhaust also contains water vapor, oxygen, and nitrogen; and under some conditions, hydrogen and methane; and trace amounts of other organic compounds.

Arrangements for collecting exhaust-gas samples are shown diagrammatically in Figure 1. Samples for determination of carbon dioxide, oxygen, carbon monoxide, methane, hydrogen, and nitrogen were collected from a metal tube inserted into the exhaust stack a short distance from the outlet of the manifold. A continuous stream of gas was drawn through this tube during sampling; a water seal was included in the sampling line as a precaution against contamination of the samples by air. An air-cooled condenser in this sampling line freed the gas stream of water that otherwise would have collected in the sample bottles. Samples for determination of carbon dioxide, oxygen, methane, hydrogen, and nitrogen were collected by mercury displacement. Samples for determination of carbon monoxide only were collected by water displacement. Samples for determination of aldehydes and oxides of nitrogen were collected (in evacuated bottles) through short lengths of glass tubing inserted into the exhaust stack through

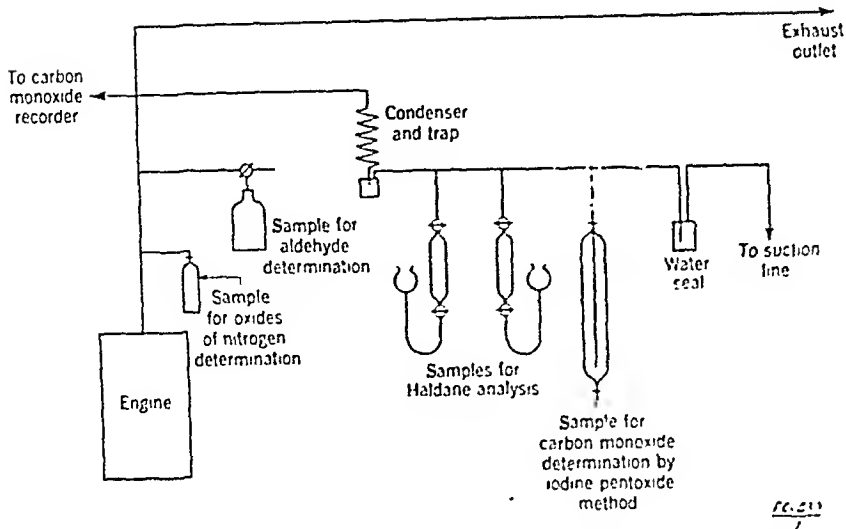


FIGURE 1—Diagrammatic sketch of arrangements for sampling exhaust gas

asbestos-packed stuffing boxes. The exhaust pipe of the engine was extended approximately 9 ft. beyond the sampling points before it terminated outdoors. This precaution is necessary in sampling the exhaust gases of an internal-combustion engine, as the pulsations in gas flow cause air to be drawn into the pipe between exhaust impulses for a considerable distance from the discharge end.

Carbon monoxide—Carbon monoxide was determined by the iodine pentoxide method when less than 0.5 per cent was present. If it exceeded this amount it was determined in a Bureau of Mines type laboratory Orsat apparatus by absorption in a mixture of cuprous sulfate, beta naphthol, and sulfuric acid.

Oxides of nitrogen—Oxides of nitrogen were determined by the phenoldisulfonic acid method.

Aldehydes—Aldehydes were determined colorimetrically with the Schiff-Elvove reagent, which produces color with practically all aldehydes, using formaldehyde as a standard.

Carbon dioxide, oxygen, methane, hydrogen, and nitrogen—These gases were determined in a Bureau of Mines type Haldane gas-analysis apparatus,

except in certain samples in which the carbon monoxide content necessitated analysis in the Orsat apparatus.

RESULTS OF TESTS

The results of the tests are presented in the following tables and figures.

Table 2 shows representative data. The complete data have been published elsewhere¹ and are not presented here because of lack of space. The constituents of the exhaust that are of particular interest from the hygienic standpoint are carbon monoxide, oxides of nitrogen, carbon dioxide, oxygen, aldehydes, soot or smoke, and oxides of sulfur if the fuel contains significant amounts of sulfur.

Effect of Fuel-Air Ratio on Composition of Exhaust Gas

The effect of fuel-air ratio on exhaust gases from internal-combustion engines is extremely important from the standpoint of hygienic atmospheric conditions. Figure 2 shows the relationship of composition of exhaust gas to fuel-air ratios ranging from about 0.01 to 0.094 lb. of fuel per lb. of air. At a fuel-air ratio of 0.0679 there would be, theoretically, with the fuel used in these

TABLE 2

Representative test data and results—Engine B at approximately 1,400 r.p.m.

Test No. →	B-13	B-14	B-15	B-16	B-12	B-70	B-72	B-69
Net power output, b.h.p.	0 ¹	8.8	17.5	26.4	37.8	40.2	41.0	40.6
Fuel consumption, lb. per hr.	4.56	6.89	9.56	12.45	18.12	21.29	24.41	29.63
Volume of exhaust gas, cu. ft. per hr. ²	4,500	4,460	4,180	4,050	3,950	3,700	3,650	4,050
Fuel-air ratio, lb. per lb.	0.013	0.020	0.029	0.039	0.056	0.070	0.084	0.094
Composition of exhaust gas, per cent by volume ³								
CO ₂	2.74	4.19	6.22	8.36	12.40	13.8	12.1	10.2
O ₂	17.14	15.13	12.20	9.26	3.44	0.8	0.3	0.3
CO ⁴	0.041	0.028	0.024	0.027	0.058	0.7	3.3	6.0
H ₂ ⁵	— ⁵	—	—	—	—	0.1	1.3	3.0
CH ₄ ⁵	— ⁵	—	—	—	0.03	0.1	0.3	0.4
N ₂	80.08	80.65	81.56	82.35	84.07	84.5	82.7	80.1
Oxides of nitrogen, p.p.m. by volume ⁶	167	267	378	448	364	346	277	186
Aldehydes, p.p.m., by volume ⁷	4	1	1	1	4	1	2	0

¹ Minimum power output. Power output of engine consumed in mechanical losses and in driving accessories.

² Calculated as dry gas at 60° F. and 29.92 in. of mercury pressure.

³ Calculated on a dry basis. Analyses in Bureau of Mines-type Haldane or Orsat apparatus.

⁴ Values expressed to three decimal places were determined by the iodine pentoxide method; in calculating nitrogen by difference these values were expressed to nearest unit in second decimal place to conform with results of Haldane analysis. Carbon monoxide determined by combustion or absorption in tests B-70, B-72, and B-69.

⁵ Dash indicates none detectable by analytical method used.

⁶ As nitrogen peroxide, NO₂; not included in sum of percentages of other gases.

⁷ As formaldehyde; not included in sum of percentages of other gases.

tests, just enough oxygen to burn completely all the fuel present, and this ratio is designated as the "chemically correct mixture." Thus, the fuel-air ratios studied included those in which air was present in considerable excess as well as those with insufficient air for complete combustion. The engines as received from the manufacturers were adjusted so that the maximum fuel-air ratio for engine A was 0.042 and for engine B 0.058 lb. per lb. The excess air present under these conditions was 61 and 17 per cent, respectively. It was necessary to change the manufacturer's adjustment of the fuel pump to obtain higher ratios at full throttle, and this was done with engine B. The maximum ratio studied was 0.094, and at this ratio only 70 per cent of the air required for complete combustion was present.

It will be observed from Figure 2 that, regardless of engine speed, the oxygen content of the exhaust decreased regu-

larly to produce virtually a linear relationship up to a fuel-air ratio of 0.06. The carbon dioxide increased regularly and a similar linear relationship was produced up to about the same fuel-air ratio. These relationships illustrate the changes in the proportions of the reacting sub-

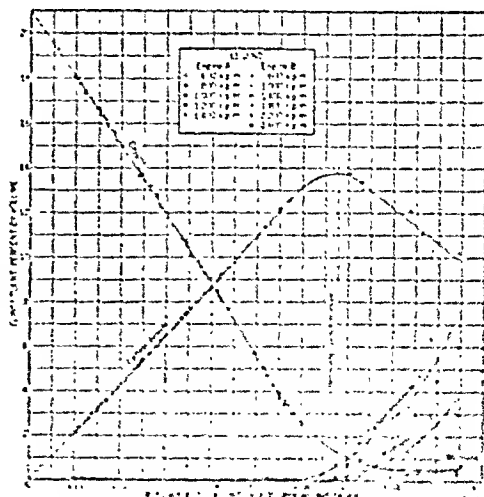


FIGURE 2—Relationship of composition of exhaust gas to fuel-air ratio

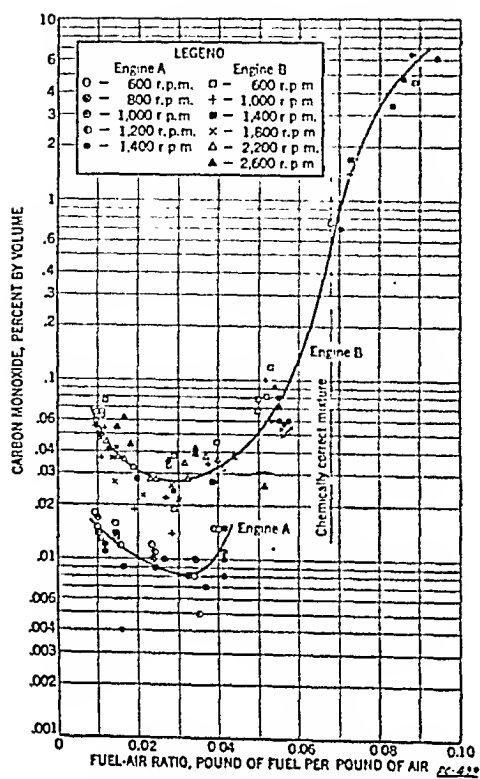


FIGURE 3—Relationship of carbon monoxide concentration in exhaust gas to fuel-air ratio

stances, fuel and air, as the power output of the engine, and consequently the fuel-air ratio, was increased. The concentration of carbon monoxide showed a marked increase as the fuel-air ratio approached the chemically correct mixture; and hydrogen and methane, which were not detected at lower fuel-air ratios, were found when the fuel-air ratio exceeded the chemically correct mixture.

Carbon Monoxide

For more complete and comprehensive presentation, the data for carbon monoxide have been replotted in Figure 3 with carbon monoxide on a logarithmic scale in relation to fuel-air ratio on a linear scale. It is evident that the concentration of carbon monoxide can vary over a wide range, depending on fuel-air ratio. Within the range of fuel-air ratios for which the engines were

adjusted by their manufacturers the carbon monoxide content of the exhaust of engine A did not exceed 0.02 per cent and of engine B, 0.12 per cent. However, in tests with this adjustment altered, as the chemically correct mixture was approached from the lean side,* the concentration of carbon monoxide increased rapidly, and the effect was even greater when the chemically correct mixture was exceeded on the rich side* and concentrations of carbon monoxide comparable to those found in exhaust gases from gasoline engines were observed. Engine speed apparently had no pronounced effect on the concentration of carbon monoxide, although some slight variations that may be attributable to speed are noticeable in Figure 3.

If any advantages from the standpoint of carbon monoxide in the exhaust gas are to be gained from the use of the Diesel engine as compared to the gasoline engine, operation must be confined to fuel-air ratios less than the chemically correct mixture. Fortunately the characteristics of the Diesel engine are such that it can be operated near its maximum power output at such fuel-air ratios (see Figure 6). Thus, it is possible to control to a large extent the carbon monoxide hazard with proper engine adjustment without significant sacrifice of power output. Although carbon monoxide can be largely controlled in this manner the hazard should not be dismissed lightly nor should it be overlooked that ventilation is required.

Oxides of Nitrogen

The maximum concentration of oxides of nitrogen (expressed as equivalent nitrogen peroxide, NO_2) observed in the exhausts of engines A and B were respectively 440 and 676 p.p.m. of exhaust

*Fuel-air ratios less than the chemically correct mixture are referred to as being "on the lean side," and ratios greater than the chemically correct as being "on the rich side."

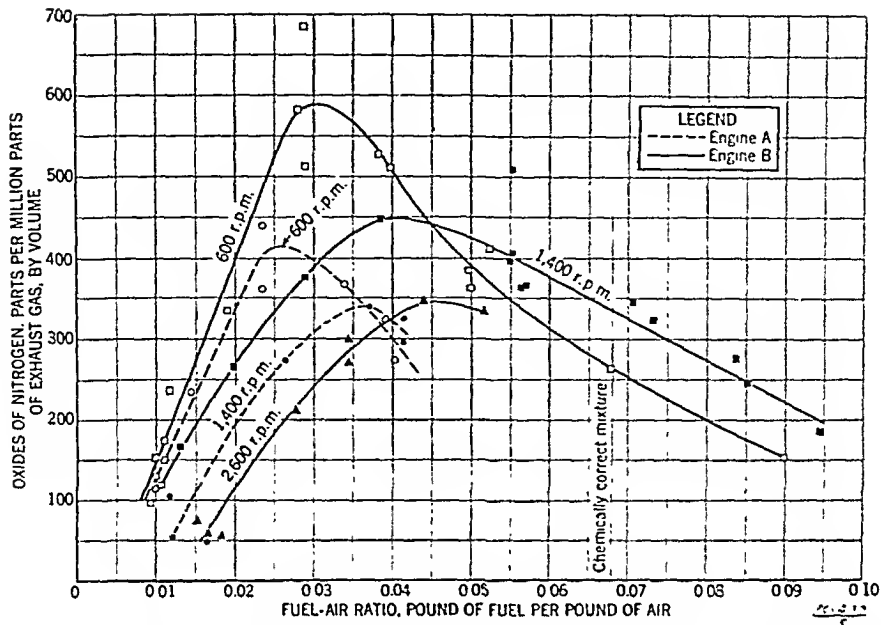


FIGURE 4—Relationship of concentration of oxides of nitrogen in exhaust gas to fuel-air ratio

gas, by volume, concentrations that obviously are of hygienic significance.

Figure 4 shows the relationship of concentration of oxides of nitrogen to fuel-air ratio. The concentration of oxides of nitrogen reached a maximum at intermediate fuel-air ratios. The maximum attained depended on engine design and speed, the value decreasing with increase in speed, with a tendency to shift to higher fuel-air ratios with increase in speed. The occurrence of a maximum in the concentration of oxides of nitrogen at intermediate fuel-air ratios may be attributable to a combination of the effects of the temperature of combustion and of the concentration of oxygen present during combustion.

From the lowest fuel-air ratios to the intermediate values, the temperature of combustion increases, and predominates in the formation of oxides of nitrogen. From the intermediate to the higher fuel-air ratios, the diminishing concentration of oxygen would tend to inhibit their formation, and appears to be the predominating factor controlling their production in this range of fuel-air ratios.

Consideration of the possible effects of such factors on the production of oxides of nitrogen indicates that the concentration of these compounds in the exhaust might be expected to vary appreciably with different engines and operating conditions.

TABLE 3
Relationship between aldehyde content of exhaust gas and odor intensity and irritating effects

Aldehyde Content, Range of Concentrations, Parts per Million	Odor Intensity	Irritating Effects
0 to 10	Faint (weak odor, readily perceptible)	None to slight
10 to 50	Easily noticeable (moderate odor)	Slight (just perceptible)
50 to 100	Easily noticeable to strong odor	Moderate to strong (midway between just perceptible and discomforting)
100 and over	Very strong (intense effect)	Intolerable (extremely painful)

With concentrations of oxides of nitrogen of the order found, dilution of the exhaust gas is necessary for hygienic atmospheric conditions.

Aldehydes

The well known characteristic odor of Diesel exhaust is undoubtedly caused by partly oxidized organic substances, and possibly products of thermal decomposition, and it seems probable that aldehydes constitute a large part of these substances.

The concentration of aldehydes ranged from 0 to 5 p.p.m. in the exhaust from engine A and from 0 to 31 p.p.m. in the exhaust of engine B.

To ascertain the significance of these results, limited observations were made of the odor intensity and irritating effects of the exhaust when samples were taken for analysis. A correlation of these data is presented in Table 3. This table was prepared from 136 observations by 11 observers during some special experiments in which the range of aldehyde concentration was considerably broader than in the tests covered by this report. The response given under odor intensity or irritation represents the majority of observations for each particular range of concentration. As might be expected, there was considerable spread in the estimates of individuals. Nevertheless, there appears to be a correlation between odor and aldehyde content. However, it is emphasized that the number of observations and observers was limited and that other unidentified organic compounds may have been present and contributed to both odor and irritation. Although aldehydes in the concentrations found do not appear to present a health hazard when compared to the other toxic gases present, nevertheless they constitute a significant nuisance worthy of considerably more study.

Figure 5 shows the general trend in

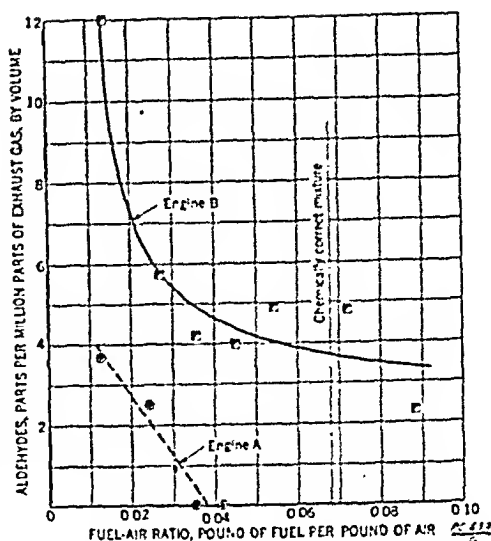


FIGURE 5—Trend of aldehyde concentration in exhaust gas with fuel-air ratio

the relationship of the aldehyde content of the exhaust gas to fuel-air ratio. The results indicate definite increase in concentration of aldehydes at the low fuel-air ratios.

Because of considerable variation in concentration of aldehyde in comparable tests, the discussion of the effect of engine speed on this constituent does not appear warranted. However, the data indicated the possibility that there was a tendency toward a decrease in aldehydes with increase in speed. As in the case of oxides of nitrogen, it appears probable also that engine design and operating conditions will have a marked effect on production of aldehydes.

Carbon Dioxide

The concentration of carbon dioxide in the exhaust from the two engines was between 2 and 13 per cent. Such concentrations may be expected from all Diesel engines, although the maximum and minimum concentrations for any given engine will depend on its adjustment. As an atmosphere containing more than 1 per cent carbon dioxide is not considered a satisfactory working environment, this gas must be consid-

ered in estimating the amount of ventilation required for safe use of Diesel engines underground.

Oxygen

The oxygen concentration in the exhaust gas is an indication of the oxygen consumed by combustion in the engine, and ventilation must be provided to replace the oxygen consumed so as to maintain an oxygen concentration greater than 19 per cent, the minimum considered permissible.

Oxides of Sulfur

Data on oxides of sulfur were not obtained because the fuel used was essentially sulfur-free. Obviously, if the fuel contains significant amounts of sulfur, it would be necessary to give consideration to the oxides of sulfur. Calculations indicate that a fuel containing 0.5 per cent sulfur would produce about 330 p.p.m. sulfur dioxide at the chemically correct fuel-air ratio. As this concentration, under certain conditions, might be the controlling factor in ventilation it is possible that the sulfur in the fuel should not exceed 0.2 to 0.3 per cent. More data are needed to establish this value definitely.

Smoke

The appearance of the exhaust was observed to obtain information on the tendency of the engines to produce smoke. When either engine was operated at its minimum load, particularly at low speed, a light blue haze was observed. This haze was present when either engine was idled, and was noticeably denser immediately after a cold engine was started. It was generally faint and could be distinguished only in reflected light. When either engine was operated under load, no haze was evident. In tests with engine B in which the adjustment of the fuel pump was altered to permit injection of additional fuel at full throttle, the appearance of

the exhaust ranged from light gray at fuel-air ratios just greater than chemically correct to black at higher fuel-air ratios.

In addition to these visual estimates of smoke in the exhaust, qualitative tests always showed the presence of soot or free carbon in the exhaust of both engines, and calculations² applied to the test data indicated varying concentrations of free carbon in the exhaust of engine B throughout the wide range of fuel-air ratios (approximately 0.01 to 0.09) covered in tests with this engine. These calculations showed a definite relationship between fuel-air ratio and concentration of free carbon in the exhaust and also conformed with the visual estimates of smoke density, exhibiting a minimum at fuel-air ratios of from approximately 0.025 to 0.04, and a maximum at the highest ratio studied. Free carbon appears to be a normal constituent of Diesel exhaust throughout the entire operating range, although by far the most dense and objectionable smoke is produced by operation at fuel-air ratios where there is little or no excess air for combustion, and this is a condition that can be controlled by restricting operation to a proper range of fuel-air ratios.

Smoke production also may be caused by other conditions, including operation with the engine below proper temperature, faulty injection of fuel spray, excessive consumption of lubricating oil, and possibly use of low-grade fuel.

Relation of Power Output to Fuel-Air Ratio

Figure 6 shows the relationship of power output at constant speed to fuel-air ratio and illustrates a relationship characteristic of Diesel engines, in common with other types of internal-combustion engines, namely, that power output increases with fuel-air ratio until a maximum is reached on the rich side. Data illustrating this relationship were

obtained in tests of engine B at 1,400 r.p.m.; a similar relationship was observed in all tests covering a comparable range of fuel-air ratios. If the tests had been extended to include higher fuel-air ratios, the power output in this range would have decreased from the maximum shown in Figure 6.

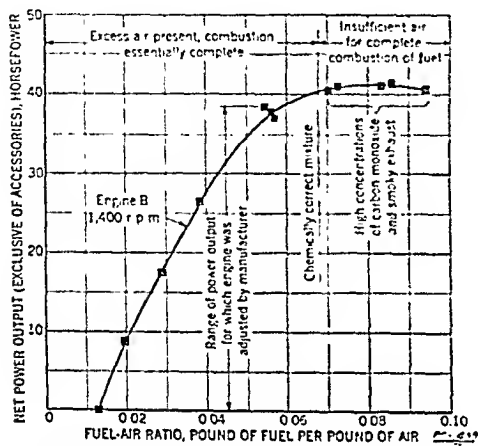


FIGURE 6—Relationship of power output to fuel-air ratio at 1,400 r.p.m. in tests with engine B

At constant speed and atmospheric conditions the weight of air drawn into a Diesel engine is approximately the same throughout the range of power output, and when combustion is essentially complete power output increases with the rate at which fuel is injected. Therefore, power output increases with fuel-air ratio in the range of essentially complete combustion.

In addition to the fact that the power output increased only slightly for fuel-air ratios above the chemically correct mixture it was noted also that this slight increase was obtained by a very large increase in fuel consumption. In other words, it is not economical to attempt to obtain an increased power output by operating at fuel-air ratios in excess of the chemically correct mixture. This point is emphasized because, as stated previously, it is necessary, in order to prevent large increases in the produc-

tion of carbon monoxide, to regulate the fuel pump so that excessive fuel-air ratios cannot be attained. Such regulation of the fuel injection also tends to reduce excessive smoke formation, and it is significant that both carbon monoxide and smoke production can be largely controlled without materially affecting the power output of the engine.

Relation of Volume of Exhaust Gas to Engine Speed

The volume of exhaust gas produced is a necessary factor in calculating ventilation requirements. In this investigation the hourly production of exhaust gas was calculated from the rate of fuel consumption and from material balances between the constituents of the fuel and of the exhaust gas.¹ Figure 7 shows the volume of dry exhaust gas produced per hour by the engines in relation to speed. Two curves are included for each engine, one for minimum power output (accessories only), and the other for maximum rated power output. Piston displacement on the intake stroke is shown because the volume of air drawn into the engine is the principal factor in determining the volume of exhaust gases produced. The curves in Figure 7 show that at any given speed the volume of dry exhaust decreased slightly as the power output of the engine increased. Part of this decrease is a result of expressing the gas volume on a dry basis and not including the calculated volume of water vapor formed in combustion. In addition, part of the decrease may be due to changes in volumetric efficiency.

The piston displacement on the intake stroke shown in Figure 7 represents the maximum possible volume of air that can be taken into the engine. As the volume of dry exhaust gas is always less than the volume of air taken into the engine, in lieu of actual test data, the piston displacement on the intake stroke could be used as an

approximation of the volume of dry exhaust gas.

The volume of exhaust gas produced per unit time may be used as a basis for estimating the quantity of ventilating air required in locations such as mines or tunnels where adequate ventilation is imperative if Diesel engines are to be used safely. This estimate of ventilation is based upon dilution with air of the toxic constituents of the exhaust to concentrations considered permissible from the hygienic standpoint. The methods of calculation used in arriving at this estimate of ventilation have been described in detail in another publication.¹ It is emphasized, however, that such calculation produces a minimum value and is based upon the assumption that air of normal composition will be supplied for ventilation. In practical applications it appears that a margin of safety is desirable, and for this reason it is advisable to furnish an excess of ventilating air rather than to adhere to the minimum indicated by calculation. Further study of Diesel engines in the laboratory and under actual operating conditions should furnish a basis for deciding the magnitude of this margin of safety. It is possible that when more experience is gained, some empirical method may be found suitable for calculating ventilation required for any particular engine, but until such broad experience is gained, the calculation of basic ventilation requirements from tests of the type described appears to be the most rational approach to the problem.

DISCUSSION

As both laboratory results and practical experience have been limited, broad generalizations and final recommendations cannot be made; however, the information obtained to date indicates certain trends that should be of interest to the industrial hygienist. The statement is frequently seen that the

amount of carbon monoxide in the exhaust of Diesel engines is negligible, with no mention of the other constituents. It is not believed that such statements are justifiable; and, even though no carbon monoxide were present, ventilation would be required to dilute the carbon dioxide produced and to maintain the oxygen content of the atmosphere above 19 per cent. The emphasis on carbon monoxide is probably due to the fact that it is associated with internal combustion engines, and from a

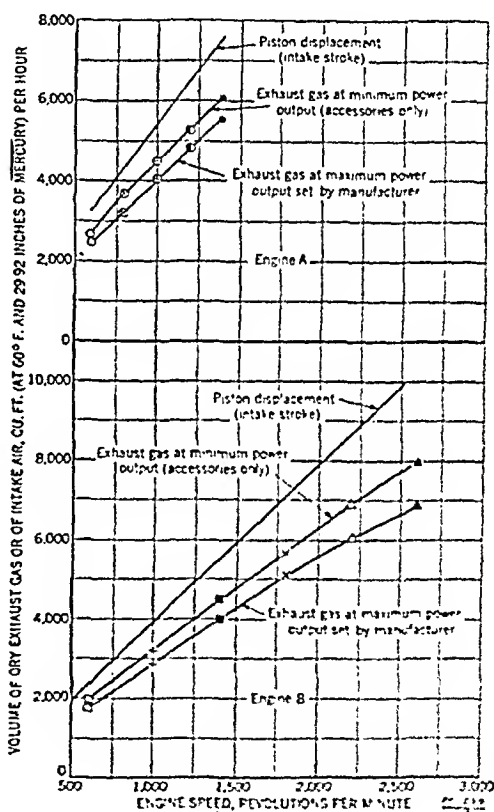


FIGURE 7—Relationship of volume of exhaust gas to engine speed at minimum and maximum power outputs

theoretical standpoint it is probably the most significant constituent of Diesel exhaust gas owing to the fact that the amounts present may vary over an extremely wide range. However, the amounts present can be largely con-

trolled, without significantly sacrificing power output, by operating in a suitable range of fuel-air ratios. Even under these conditions some carbon monoxide will be produced, and ventilation will be required for dilution. Provisions to prevent excessively high fuel-air ratios should be provided in the design of the engine as this is of extreme importance in the control of the carbon monoxide and smoke.

Oxides of nitrogen also occur in amounts that would be dangerous to health, and dilution of these gases is essential in preventing the production of unhygienic atmospheric conditions.

From a limited observation of Diesel locomotives underground, it seems possible to conclude that the ventilation required to dilute the carbon monoxide, oxides of nitrogen, and carbon dioxide to permissible concentrations might not be adequate to eliminate a nuisance from the smoke and odor of the exhaust gases. In other words, even though ventilation suffices to dilute the toxic gases to a permissible limit, additional ventilation may be necessary to prevent complaints from smoke and odors and irritation from the exhaust gases.

In regard to smoke, it might be pointed out that controlling the fuel-air ratio appears to have a very beneficial effect in preventing the occurrence of significant amounts of unburned carbon or smoke in the exhaust gases. For example, the dense black smoke that is frequently associated with Diesel exhaust was observed only when the engine was operated at fuel-air ratios exceeding the chemically correct mixture.

The fact that certain harmful and objectionable constituents of Diesel exhaust gas can be largely controlled by proper design of Diesel engines is interesting, in that it is in line with the recent trend of giving consideration to the industrial hygiene hazards associated with new developments.

SUMMARY

The composition of the exhaust gas of two commercial Diesel engines in proper mechanical condition was determined at different speeds and power outputs for fuel-air ratios ranging from approximately 0.01 to 0.09 lb. per lb. The constituents of the exhaust were carbon monoxide, oxides of nitrogen, carbon dioxide, aldehydes, soot, oxygen, nitrogen, water vapor, and under some conditions hydrogen and methane or other hydrocarbons. Oxides of sulfur would be present if the fuel contains sulfur. Carbon monoxide, carbon dioxide, and oxides of nitrogen were present in concentrations that are considered harmful to breathe. Under some conditions objectionable amounts of aldehydes and smoke may be produced.

The fuel-air ratio was found to have a marked effect on the production of carbon monoxide. When the engines were operated within the range for which they were rated and adjusted by the manufacturers, the maximum concentration of carbon monoxide in the exhaust from one engine was 0.02 per cent and in the other 0.12 per cent. However, by changing the adjustment limiting the quantity of fuel injected at full throttle so that fuel was injected in excess of that which could be burned completely by the air taken into the engine, the carbon monoxide was increased markedly, and concentrations of the order of those found in exhaust from gasoline engines were produced. Moreover, under these conditions, a large amount of smoke was produced. It is significant that the production of carbon monoxide and smoke can be largely controlled by the proper adjustment of the fuel-air ratio without a significant sacrifice of power output of the engine at full throttle.

Although experience is limited, the results indicate the importance of controlling the fuel-air ratio and also that Diesel engines should not be operated

underground unless ample ventilation is provided.

ACKNOWLEDGMENTS

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Sulfonamide Therapy in Male Gonorrhea

A Comparative Study*

ROGERS DEAKIN, M.D., MORRIS WORTMAN, AND
RICHARD LAFORCE

Washington University Clinics, St. Louis, Mo.

THIS report covers the treatment of 519 unselected cases of male gonorrhea with seven different chemotherapeutic agents. Local therapy was used routinely with four of the seven drugs, not with the other three. The men were treated in the genitourinary section of the Washington University Clinics, St. Louis, between July 1, 1938, and July 1, 1940. The organization of the section has been reported in some detail in *Venereal Disease Information*, August, 1940. One item of note is the fact that, prior to the reorganization of the section two years ago, only 2.5 per cent of the patients remained under observation until cured. Since adequate laboratory, medical, and case control measures were instituted, only 10 per cent of the case load has been lost, 75 per cent dismissed as cured after satisfying rigid criteria of cure, and the remaining 15 per cent closed as unsatisfactory for study. This last category includes patients transferred to other treatment centers or who found it necessary to leave the city, those who attempted unauthorized self-medication, some who became reinfected while under treatment, and a few who for one

reason or another had to be eliminated from the series.

This clinic serves as a teaching unit in the medical school and as one of several treatment centers in the municipal venereal disease program, coöperates with the U. S. Public Health Service in its clinical studies, and provides a demonstration unit for the State Board of Health of Missouri. It also provides means for the clinical evaluation of different chemotherapeutic agents.

Duplicate records are kept of each patient. One becomes a permanent part of his clinic record, the other is sent to the U. S. Public Health Service for statistical study. The record form used was devised by the American Neisserian Medical Society in coöperation with the U. S. Public Health Service.

Every effort has been made to systematize the treatment and control of patients. The routine of therapy has been modified from time to time, particularly with regard to provocative studies and the length of the period of observation. Minimum requirements are those recently set up by the Clinical Coöperative Group for Male Gonorrhea. These consist of 3 negative cultures, 1, 5, and 9 weeks after treatment has been stopped. Earlier requirements in this clinic called for various provocative procedures during a month of observation after the period of active treatment and 3 monthly check-ups thereafter,

* From the Washington University Clinics, St. Louis, Mo., in coöperation with the State Board of Health of Missouri.

Read before the Southern Branch American Public Health Association at the Ninth Annual Meeting in Louisville, Ky., November 13, 1940.

TABLE 1
Final Disposition of All Cases

Drug	Per cent Cured	Per cent Lost	Per cent Unsat. for Study	Per cent Trans- ferred	Per cent Rein- jected	Closed without Proof of Cure		No. of Cases
						Per cent Left City	Per cent Oral Therapy Changed	
Sulfanilamide	64	15	9	5	1	1	5	95
Benzene-sulfone- dimethylamide	61	6	5	6	6	6	10	61
Sodium benzene-sulfone- dimethylamide	63	10	3	3	4	8	9	191
Sulfanilamide- magnesium oxide	66	8	4	6	0	4	12	50
Sulfapyridine	70	4	2	0	9	2	13	47
Sulfamethyl- thiazole	81	5	0	0	3	5	6	37
Sulfathiazole	71	5	3	0	15	3	3	38
Total								519

making altogether an average of $5\frac{1}{2}$ months of treatment-observation. The latter criteria required a minimum of 6 negative cultures. Approximately 5,000 Gram stains and over 5,000 cultures were made on this group during the 2 year period. All cultures were made by Dr. Axel Gronau, Department of Bacteriology, Washington University.

Since a central statistical agency has not been available for the evaluation of drug therapy, we have devised our own method for comparing results. This consists of recording the weekly bacteriologic progress of each patient on special charts.* These charts show at a glance the general effectiveness of a particular sulfonamide drug on a group of patients. More important, however, is the fact that they make possible an accurate comparison of different routines of therapy by means of a weekly summary on each chart of positive and negative smears and cultures, lapses, changes in therapy, cures, etc. The charts are displayed prominently in the clinic so that all personnel is acquainted with end results as well as with the early progress of any drug on trial.

This report includes three groups of patients receiving different sulfonamide drugs which are now commercially available. One group of men received 2.6 gm. of sulfanilamide daily, combined with self-administered hand injections of protargol 0.25 per cent twice a day.

A second group was made up of 47 cases in which 2 gm. of sulfapyridine given daily for a period of 10 days was the only therapeutic agent. The rapidity with which this group became non-infectious was notable.

The third group illustrates the striking progress and end results of the first 38 cases treated with sulfathiazole alone, given at the rate of 4 gm. a day for 5 days.

Table 1 shows the final disposition of the entire group of 519 cases. Seven different chemotherapeutic agents are listed. Attention is directed to the column showing the instances in which oral therapy was changed or discontinued. Figures from 3 to 14 per cent are noted. These may be considered as drug failures. Responsibility for the decision to change or drop oral medication cannot be reduced to a routine. We have found no means of eliminating the responsibility of the clinician for this decision. This represents the chief point at which the personal equation is

* Three progress charts to record the bacteriologic response of each patient during successive weeks of treatment and observation have been omitted from the text because reproduction was deemed impossible.

permitted to enter in the routine as we maintain it.

Reinfections are recorded as such only when the patient admits re-exposure without prophylaxis before satisfying all tests of cure; otherwise, reappearance of the clinical and bacterial signs of infection is recorded as a relapse.

The "cured" percentages in this table are gratifying but not particularly significant from a comparative standpoint because individual observation may have been continued for a year. Most cases should have attained a cure in that time regardless of the type of therapy employed.

nausea. The side reactions from sulfapyridine were more noticeable but also not severe enough to interfere with the established routine. This may have been due to the fact that only 2 gm. a day were used. An important factor in the control of such a group is not to make the patient ill from the medication in use. Directions for taking the drug were also simplified by a uniform daily dosage, another factor in the control of this type of patient.

It is also of interest that the total dosage of both sulfathiazole and sulfapyridine was considerably less than that of sulfanilamide. Uninterrupted medication was used with all three

TABLE 2
Comparison of Dosages, Toxicity and Therapy

<i>Drug</i>	<i>Average Daily Dosage (grams)</i>	<i>Average Total Dosage (grams)</i>	<i>Relative Toxicity</i>	<i>Rest Period between Courses</i>	<i>Associated Local Therapy</i>
Sulfanilamide	2.7	75	++++	no	yes
Benzene-sulfone-dimethylamide	2.7	28	+	yes	yes
Sodium benzene-sulfone-dimethylamide	2.7	21	+	yes	yes
Sulfanilamide-magnesium oxide	2.7	74	+++	no	yes
Sulfapyridine	2.0	21	+++	no	no
Sulfamethylthiazole	4.0	20	+	no	no
Sulfathiazole	4.0	20	+	no	no

Table 2 shows the average daily dosage of each drug in the series, the average total dosage, the relative toxicity of the drugs one to the other in the dosages employed, whether or not a rest period between courses of oral medication was used, and whether local therapy was used in conjunction with oral therapy.

It is significant that, although larger daily doses of sulfathiazole were used than of sulfapyridine or sulfanilamide, the side reactions were notably less. In a total of 200 cases treated with sulfathiazole there were no ill effects sufficient to withdraw the drug. Numerous patients complained of a transient

drugs, but the length of time the drug was given averaged 5 days for sulfathiazole, 10 days for sulfapyridine, and about 30 days for sulfanilamide.

That the good results obtained with both sulfapyridine and sulfathiazole were obtained without the use of local therapy is of most significance.

Table 3 shows the rate at which the seven groups of patients were rendered non-infectious. The percentage of negative smears and/or cultures obtained each week for 10 weeks is shown. It must be noted that perfect attendance each week for every patient was not realized so that the percentages shown assume that the bacteriologic response

TABLE 3

Probable Percentage of Negative Smears and/or Cultures by Weeks

(Based on perfect clinic attendance)

Drug	Cases	Weeks									
		1	2	3	4	5	6	7	8	9	10
Sulfanilamide	95	19	29	39	49	57	67	66	71	75	77
Benzene-sulfone-dimethylamide	61	35	46	60	64	72	73	76	80	72	78
Sodium benzene-sulfone-dimethylamide	191	36	52	63	71	73	77	81	84	83	83
Sulfanilamide-magnesium oxide	50	56	72	69	72	79	80	84	86	79	74
Sulfapyridine	47	77	87	91	97	97	94	97	97	90	97
Sulfamethylthiazole	37	94	97	93	93	93	94	93	93	93	93
Sulfathiazole	38	94	97	100	93	100	96	100	92	96	100
	519										

of lapsed patients in any one week would be the same as for those who were under observation that week. We believe this to be fair in that the lapse rate did not exceed 30 per cent in any group during the first 10 week period of observation. In other words, if half of a group of 90 patients who were seen in the second week of their disease were still infectious, it would seem fair to assume that half of the 10 remaining patients who were not seen in that week likewise remained infectious, making a total of 50 out of the total of 100 who were infectious in the second week. Likewise if, out of a group of 100 patients, 20 were not seen in the third week of their disease and 75 per cent of the remaining 80 were non-infectious, then it may reasonably be assumed that 75 per cent of the 20 lapsed patients were also non-infectious at that time. This would mean that 75 of the total 100, or 75 per cent, were rendered non-infectious at this time by the therapy employed.

The response to treatment after the first week is most significant. This ranges from 19 per cent negative smears and/or cultures in the "sulfanilamide plus local" group, to 94 per cent in the sulfathiazole treated group without local treatment. Rapid sterilization of gono-

coccal infections is of paramount importance if effective control of gonorrhea is to be attained. In this respect, sulfathiazole would appear to be more effective than sulfapyridine and both drugs, far ahead of sulfanilamide. At the end of 10 weeks, however, the discrepancies in results are less noticeable. By this time the patient's own normal defense mechanism against the gonococcus is also a factor so that cure will be obtained in most patients as time goes on regardless of the type of therapy.

While only 38 cases treated with sulfathiazole are shown in this report, the behavior of this group is being paralleled closely by an additional 167 men who are in the process of study.

Thus, one may reasonably expect 4 men out of 20 to be cured at the end of 1 week when treated with a moderate daily dose of sulfanilamide combined with mild local therapy. Two grams of sulfapyridine daily for 10 days without any local treatment will cure 15 out of 20 men. On the other hand, 19 out of 20 men will be cured at the end of 1 week when the only therapy employed is the administration by mouth of 20 gm. of sulfathiazole over a 5 day period.

The results with sulfapyridine might have been better if the dosage for the

first few days had been larger than 2 gm. a day. We are not prepared to deny this, but we preferred to sacrifice a possible improvement in this respect to avoid a higher lapse rate from drug intolerance.

SUMMARY

A clinical evaluation of four experimental and three commercially available sulfonamide drugs in the treatment of 519 unselected cases of male gonorrhea has been made in a 2 year period at the Washington University Clinics. Coördination of an adequate laboratory service and an efficient case finding and case holding service with close medical supervision has been made possible by assistance with federal funds provided through the Missouri State Board of Health. This in turn has permitted an

accurate clinical and bacteriological comparison of different drugs under carefully controlled conditions.

CONCLUSIONS

Sulfathiazole appears to be the most effective of the drugs at present commercially available for the treatment of male gonorrhea. The rapidity with which it renders a male patient non-infectious, together with the fact that it is well tolerated and relatively non-toxic, permits its use on a wide scale for the treatment and control of male gonorrhea.

NOTE: The benzene-sulfone-dimethylamide, sodium benzene-sulfone-dimethylamide, sulfanilamide-magnesium oxide, sulfamethylthiazole and sulfathiazole used in this study were supplied by the Department of Medical Research, Winthrop Chemical Company, New York, N. Y.

Contribution of Student Health Service to Adult Health Education*

CHARLES E. SHEPARD, M.D., F.A.P.H.A., AND
IRVIN W. SANDER, M.D., DR.P.H.

Professor of Hygiene and Director of Men Students' Health Service, Stanford University, Calif.; and Director of Student Health Service, Wayne University, Detroit, Mich.

THOSE of us engaged in the medical supervision of college students are being stimulated to evaluate our contribution to adult health education because of the growing interest in this subject. It is the purpose of this paper to indicate how much the college physician may contribute to adult health education through his contacts with young people who are preparing themselves in college for the responsibilities of adult living. The college physician is employed primarily to keep students well enough to pursue their studies. Although his work usually includes the actual treatment of disease, his broader responsibilities to the college authorities are concerned with all possible methods of preventing disability in the student body. Every student forced to leave college because of disability represents a loss of investment not only to himself and his parents but to the college and to the state.

It is the college doctor's job to use every influence at his command to prevent such catastrophes. As a practising physician his work is unique, but also he is unique in that he is a member of

a group engaged in the task of educating young men and women. Therefore he should recognize that he has an opportunity to contribute to this task by instructing in matters of personal and community health.

The young people in our colleges represent an important financial and social investment. Returns on this investment are poor if these people do not learn the principles of personal and community health that will enhance their value as voting and often leading members of their communities. Sally Lucas Jean¹ has stated this point clearly in connection with the value of school health work:

Much has been written on all phases of the school health program and much progress has been made, but little emphasis has been placed upon the opportunity of the school to prepare the child to support public health measures when he becomes a voter.

If this is true of the child in school it is more true of the college student, since the state has invested more heavily in his education and because he is nearer the voting age and more directly concerned with the application of health education principles to adult life.

Because the college is trying to help these young men and women meet the challenge of community life after gradu-

* Read before the Health Education Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940

ation, it is important that in this educative process they learn to understand community health needs, that they have a basic knowledge to guide them in matters of personal health and that they learn something of the objectives and elements of preventive medicine. "It is well known that health knowledge far exceeds health practices, and to help bridge this gap is one of the privileges of education."² The real challenge of every college physician and hygiene teacher is the opportunity to help the student recognize the value of putting his health knowledge into practice.

Any evaluation of contributions that colleges are making to the field of adult health education raises two questions: (1) Are young people carrying away from our colleges something that will help them think and act intelligently as adults in matters of health? (2) What college experiences are contributing most to adult health education? Although a number of experiences within the college contribute indirectly to education in health matters, there are two experiences that operate most directly, namely, the contacts of the student in the hygiene classroom and his visits to the college physician's office. Both these experiences have fine possibilities to contribute to adult health education, but there is some question as to how much each is really contributing.

Every evidence points to the fact that less than one-half of the students now in college are receiving classroom instruction in hygiene or preventive medicine. In a recent study of college health programs made by the American Youth Commission³ it was found that less than two-thirds of our American colleges and universities are offering courses in these subjects. This has been recently confirmed by one of us⁴ who, as chairman of the committee on informational hygiene, made a canvass of 179 member institutions of the Ameri-

can Student Health Association and found that courses on health subjects were being offered in slightly more than a hundred of these colleges and universities. It is significant to learn from this report that the average extent of college credit in these courses was slightly over two semester units. In the equivalent of two hours for one semester it would be difficult to cover a field as broad as preventive medicine even on an elementary level. Courses are under the direction of medically trained people in less than one-third of the group.

This lack of health instruction in our colleges is due partly to a certain amount of stigmatization attached to the name "hygiene" in the minds of students. This is possibly a carry-over from lectures on sex, alcohol, and tobacco, delivered under that title in the lower schools. It is due also to the fact that in many colleges the courses in hygiene are being taught by faculty members not fully equipped to present modern concepts of health education.

Such courses would be benefited by more technical direction from the college physician. It might be profitable also to change the course title to "Elements of Preventive Medicine," as has been done in some universities (University of Minnesota). It is indeed unfortunate that these courses in elementary preventive medicine and public health are available to so few college students, since they are such valuable instruments in preparing young people to meet the health problems of adult life. We may be sure that the student's experience in the college hygiene classroom makes a distinct contribution to his preparation in health for later life, but all too few students are exposed to this experience and too many of the courses given lack dynamic material, effectiveness in teaching method and technical medical direction.

More students come into contact with the principles of preventive medicine

through the college physician than through classroom teaching during their college experience. Physicians are now employed in the majority of American colleges and universities. There is considerable variation in the amount of professional work being rendered, but medical service is fairly complete in over 300 institutions according to a recent study.⁵ These colleges have recognized the value of providing the student with easily accessible facilities for medical care and advice to protect him against the disastrous results of disability, health neglect, and physical or emotional maladjustment.

Outpatient medical care is available in the so-called Student Health Services, and bed care is available in many institutions through student infirmaries or hospitals. The Student Health Service is not strictly an outpatient clinic or dispensary; neither is the infirmary usually a fully equipped hospital. Emphasis in the Student Health Service is placed upon general medical advice and the prevention and early treatment of illness. The infirmary is primarily equipped to provide bed care for students living away from home who develop illnesses that require only home care. The activities of both these services are therefore quite distinctive to the health problems of the young person in college. Although the physicians engaged in this type of work are concerned with the diagnosis and treatment of illness and injury, the chief emphasis of their work is that of prevention of disease and instruction in matters of health that will help the student to adjust himself to present environment and to health problems in life after graduation.

The work of the college physician offers opportunities for health instruction which have distinct advantages over classroom instruction. When a student comes to the physician for the care of an illness or for medical counsel

he is in a peculiarly receptive mood. He has an immediate problem which is vital to him and for which he seeks an immediate solution. He desires knowledge and is ready to put that knowledge into action.

Instruction in the doctor's office has the further advantage of being individual in character; it takes into account the individual's background in matters of health, his particular needs, and the most appropriate educational method to meet these needs. The unique part of this individual educative process is that the student actually participates in the experience. "Our teaching is done by a combination of classroom method whereby the learner is at once the object of the demonstration and the beneficiary of the method. What could be more ideal?"⁶ Education in other fields has used the laboratory to accomplish just this method. How much simpler would be the *classroom* teacher's job if students consulted him with the same motives of personal concern and the same receptiveness to instruction that exist when they consult the college physician.

Now let us see actually how the experiences of a student with his college health service may include health instruction that will contribute to his health education as an adult. His first contact with this service is for a periodic health examination required by most colleges of every entering student. This is probably his first complete health examination. He may come through the experience somewhat dazed, but he will soon become enlightened when he learns the purposes of the examination, the interpretation of its findings, the assurance that he is in good health, or the encouragement that will lead him to the correction of remediable defects. He may recognize the value of having these examinations repeated at regular intervals during and after his college career. If he plans to study for certain

professions he will be required to have these examinations repeated regularly while in college and will realize that this is the best possible guarantee of the special investment placed in his education.

Invaluable opportunities for health instruction arise in connection with the interpretation of these health examinations. The student often needs advice about his weight or help in balancing his diet. (Most students like others of us feel that they should be either heavier or lighter than the scales state.) He may need some instruction in the matter of selecting appropriate medical care for the correction of defects. He should gain some knowledge as to reasons for the various maneuvers of the physical examination. When tuberculin tests or radiological studies are included in these examinations, the student should receive valuable knowledge about tuberculosis. It is surprising to note the increasing interest of students in this disease since testing methods were introduced into our colleges. This is evidenced by the increasing number of students who ask to be given the test and by the number who come in to discuss various aspects of the disease. It is surprising also to note the increasing interest in the Wassermann test and in the whole subject of venereal disease since these tests were included routinely in the college health examination.

In this connection, we have been much interested in noting the increased number of student interviews in regard to marriage during the past year. This is due largely to the new state laws in California and Michigan which require a certificate of blood examination as part of the application for marriage license. When the student calls for this test or certificate he has a good opportunity to discuss the subject of venereal disease, and this conversation leads to other health matters associated with marriage.

Student interest in communicable diseases is aroused when immunizations are given at the time of the admission examination, and there is little doubt that these are valuable instructional devices. Furthermore, it is surprising to see how much information on the subject of communicable disease is gained by students at the time of an epidemic on the campus. They learn very shortly the presenting symptoms, possible methods of prevention, general precautionary measures to be taken, and the incubation and isolation periods. From our experience as college physicians we may safely say that the student group needs only a campus epidemic to improve their general knowledge of communicable disease and to recognize the part that they can take as members of a community to aid in its suppression.

After the health examination, the student's next contact with the health service is usually for the care of an injury or illness. If he can meet a doctor who is really interested in the educational opportunities of his work, the student will gain much information about his trouble and about other associated health matters during these visits. He will be encouraged to return again at the earliest sign of illness. This is good advice to the new student who often hesitates to call on the doctor for care of minor conditions. However, one illness which is allowed to develop to major proportions will teach him the value of going to the health service early enough next time so that his probable disability period may not be so disastrous to his study program. Actually, the new student learns much about these procedures of going to the doctor from older students who are able to tell him the value of early medical care gained from their own experience. Probably no other clinician sees so much disease in its subclinical form or in its incipency. This procedure brings to the college physician many conditions

not serious enough to be seen by the doctor in private practice, but it also reduces the total amount of disability in the student body. This is borne out by the fact that deaths from appendicitis and pneumonia are extremely rare in colleges where health service is available, that tuberculosis is identified frequently in its subclinical stages (I refer here to recent studies of Dr. Stiehm in the Student Health Service at the University of Wisconsin⁷).

It is interesting to note that the average period of hospitalization is less than half as long for young people attending colleges where health service is provided as for those in colleges where no such service is available. Surely, the young man or woman who has learned the value of early and competent medical care while in college has passed important examinations in the subject of adult health education.

The authors are much interested in the number of letters received from former students indicating their desire to find physicians in their communities in whom they may place the confidence they had developed in the health service physicians. They are looking for someone who will use the same technics in practice, who will have time to discuss health matters with them, and who will refer them for bed care to an accredited hospital. Surely this is evidence of an ability to discriminate in favor of competent medical service and as such it is an important contribution of the college health service to adult health education.

Visits to the health service for the care of illness give the student an opportunity to become acquainted with the physician so that he will be ready to seek help from him in the solution of personal medical problems not associated with acute illness. Some of these problems arise from unsuccessful experimentation with such matters as sleep and diet and unbalanced schedules. Some arise from failure to adjust to

physical handicaps or to psychological problems in the environment, while others are the result of post-adolescent struggles with health problems of sex, marriage, and future vocation. Many troubles are emotionally colored or appear on the surface as physical symptoms which actually mask mental maladjustments or even neuroses. It is important that such problems be attacked in their incipency, not only to help the student make immediate adjustment, but also to reëducate him for the future. The college physician is interested in providing every facility for giving these problems the attention they deserve because they may be forerunners of more serious physical or mental trouble, because they may otherwise escape early attention, and because their solution may have important implications for future health practices. This form of medical counselling is indeed a vital contribution to adult health education.

During his four or more years in a college or university which has a Student Health Service fulfilling its educational opportunities, the student usually has had a number of experiences that contribute to his health education as an adult. He has had his first periodic health examination and frequently has begun the habit of seeking these examinations regularly. He has learned something about his health assets and liabilities which should help him balance his health budget regularly in future life. He has learned the value of correcting remediable handicaps and adjusting happily to handicaps that cannot be altered. He has learned that early medical care in the event of illness is the best protection against long periods of disability or health catastrophe. He has learned something about what the science of medicine can and cannot do for him, what he should expect of medical and hospital care, and how to discriminate between competent and

incompetent medical technics. He has learned to depend upon medical advice rather than the advice of his neighbors and friends for the solution of personal health problems. Indirectly he has gained some knowledge of how a community protects its citizens against communicable diseases, against water and food contamination, and against safety hazards.

But with all this favorable beginning he has only passed his initial examination in adult health education. He may deserve a certificate of proficiency in the fundamentals of this subject at the time he receives his academic degree. His potentialities in the subject are good, but there is much yet to be learned, there are many practices learned in college that must be continued, and

some new knowledge must be put into practice when he becomes a member of the community. That becomes the obligation of community health education. It is the sincere hope of the college physician that the adult health educator will find a receptive, interested, and informed student in the college graduate.

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Clinical Consultations and Hospital Care Services in a Maternal and Child Health Program*

MARTHA L. CLIFFORD, M.D., F.A.P.H.A.

*Director, Bureau of Child Hygiene, Connecticut State Department of Health,
Hartford, Conn.*

THE need for more and better medical care for people in the lower-middle income group has been recognized for years. The rich and the poor already benefit by modern medical science, but the low wage earner cannot pay for treatment which requires laboratory tests, x-rays, and hospital care. The Connecticut State Department of Health through its Bureau of Child Hygiene is taking an active part in attempting to solve the problem of medical care for obstetric and pediatric cases in families which are medically indigent by offering clinical consultations to family physicians in charge of such cases and by paying for hospital care wherever necessary.

Nearly three years ago, a service providing clinical consultation to family physicians for their obstetric cases was started through the united efforts of the State Medical Society and the State Department of Health. The purpose of this service was to make it possible for physicians to obtain skilled obstetrical consultation for abnormal or borderline cases who otherwise would not be able to secure this type of care. It has seemed that a service providing pediatric consultation, also a means of paying

for necessary hospital care for both obstetric and pediatric cases occurring in medically indigent families, would be most worth while.

SOURCE AND USE OF FUNDS

In connection with the 1939-1940 Connecticut State Plan for Maternal and Child Health Services, a request was made to the U. S. Children's Bureau for funds to pay for clinical consultations and for hospital care of obstetric and pediatric cases referred by the clinical consultants. The funds available are insufficient to assume payment of consultation fees and the hospital bill of all cases occurring in medically indigent families in the state. It is felt that in cities with a population greater than 50,000, residents have better access to clinical facilities than do patients living in smaller communities. To be eligible for the consultation service, a patient must be a resident of a town having a population of less than 50,000 and must be self-supporting but unable to pay for medical care. Financial eligibility of each case is determined by the family physician who finds out, if he does not already know, whether the case is on town aid or is unable to pay medical expenses. Consultation fees are paid upon receipt of the appropriate form signed by the attending physician and the consultant. A fee of \$5 is paid for

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a consultation in the consultant's office, while a fee of \$10 is paid for a consultation which requires the consultant to travel to the patient. A maximum of \$20 for consultation fees is allowed for each case. Consultants are reimbursed for travel at the rate of 5 cents per mile. If transportation of the patient to the hospital requires an ambulance, the charge will be paid at a stated rate by the Bureau of Child Hygiene.

Hospital bills for the patients, who are placed on ward service, will be paid at previously arranged rates either on an all-inclusive per diem rate, or at a basic per diem rate plus extras. Consultants may authorize hospital care for the first 4 days, while approval of extension of hospitalization rests with the Director of the Bureau of Child Hygiene. Investigation of cases hospitalized may be necessary in certain instances. No patients except premature infants will be accepted for hospital care unless hospitalization has been recommended by an obstetrical or a pediatric consultant. It should be emphasized that except for premature infants, cases accepted for hospital care are those whose family physician has requested consultation and for whom the consultant has recommended hospitalization. In those instances where the consultant has been called by the family as its family physician, no consultation fee is available, but the consultant may authorize hospital care. Cases already in the hospital are not eligible for hospital care under Bureau of Child Hygiene funds.

APPOINTMENT OF CONSULTANTS

Consultants are appointed following their recommendation by the Public Health Committee of the State Medical Society. It has seemed expedient to require one classification of qualifications for physicians practising in urban centers and another for physicians practising in towns having a population of

less than 50,000. Since May 1, 1940, the policy has been to appoint physicians who meet the following requirements:

PHYSICIAN REQUIREMENTS

Physicians practising in cities or groups of towns where the population is greater than 50,000 must be certified by the American Board of Obstetrics and Gynecology or certified by the American Board of Pediatrics.

Physicians practising in cities or groups of towns where the population is less than 50,000 must have had 1 year's rotating internship and at least 1 year's hospital training in obstetrics or pediatrics, plus 5 years' service on the obstetric or pediatric staff of the local general hospital; or consideration will be given to physicians who have taken a year of graduate work in their specialty, or who have been responsible for the obstetric or pediatric service of the local general hospital for 10 years or more, providing the record of that hospital is satisfactory.

HOW CONSULTING SERVICES FUNCTION

A physician in charge of an obstetrical or pediatric case, feeling that consultation is desirable, calls a consultant on the list received from the State Department of Health and asks him to see the case. The consultant makes an examination and gives his recommendation for treatment to the attending physician. Consultation may be had for obstetric patients at any time during pregnancy, at the time of delivery, or during the postpartum period. For pediatric patients, the attending physician may call a pediatric consultant for any infant or child under 16 years of age who is acutely or chronically ill and who presents a diagnostic or therapeutic problem.

PROVISION FOR HOSPITAL CARE

If treatment recommended by the consultant requires hospitalization, and the attending physician agrees, the patient is sent to the nearest approved hospital. The form signed by the consultant authorizing hospital care for the first 4 days, should accompany the patient to the hospital. The patient is

placed on ward service. If the hospital stay is expected to be longer than 4 days, the superintendent requests extension of hospitalization on a form provided for that purpose. No consultation fees are paid for patients while on ward service, but provision is made for all necessary x-rays and laboratory tests.

HOSPITAL STANDARDS

Hospitals approved for care of obstetric or pediatric cases must meet definite standards. Since the State Department of Health licenses maternity hospitals according to minimum requirements in the *Sanitary Code*, it has been necessary to designate only a few additional requirements for maternity hospitals approved for care:

HOSPITAL REQUIREMENTS FOR OBSTETRIC CASES

They must have on their obstetrical staff a physician who has been appointed as an obstetrical consultant. The attending staff and obstetrical consultants shall make a thorough review and analysis of the obstetric work done in the hospital, at least monthly, with particular consideration to all deaths (maternal, neonatal, and stillborn) and morbidities and complications. Facilities must include x-ray equipment and trained personnel; an operating room equipped for performing major surgical operations; a laboratory for blood counts, hemoglobin determinations, typing and cross-matching of blood, for blood chemistry, for bacteriological examinations, and equipment necessary for giving blood transfusions; and ambulance service available throughout the area served by the hospital. Furthermore, it is recommended that the hospital require that a consultation be held with a specialist in obstetrics prior to any major obstetrical operation and for the treatment of serious complications of pregnancy.

Hospitals approved for the care of infants and children under 16 years of age (not including premature infants) are required to meet certain standards:

HOSPITAL STANDARDS FOR CHILDREN UNDER 16

The pediatric service shall be under the supervision of a staff including at least one

physician who has been appointed as a pediatric consultant; the attending staff and pediatric consultants shall make a thorough review and analysis of the pediatric work done in the hospital, at least monthly, with particular consideration to causes of deaths and illnesses; a registered nurse shall be in attendance at all times; the building, equipment, and surroundings shall be kept clean at all times, and the management and operation of the hospital shall be such as reasonably to insure the health, comfort, and safety of the patients; the buildings, equipment, and precautions taken to provide for the safety of patients and employees in case of fire must meet the approval of the State Commissioner of Health; adequate facilities must be available for the isolation of children with evidence of infection; the equipment of the operating room shall be adequate for the performing of major surgical operations; adequate laboratory facilities must be available for blood counts, hemoglobin determinations, typing and cross-matching of blood, urinalyses, blood chemistry, bacteriological examinations, routine pathological examinations; adequate facilities for giving blood transfusions; facilities for supplying oxygen and apparatus for its continuous administration; x-ray equipment and trained personnel; accurate and complete medical records including history, physical examination, laboratory data, and records of treatment; ambulance service available throughout the territory served by the hospital. In addition it is recommended that pediatric patients be segregated from other patients.

In addition to meeting hospital standards for children under 16, hospitals caring for premature infants must have:

HOSPITAL STANDARDS FOR PREMATURE INFANTS

A separate nursery, or other facilities, providing segregation in a suitable environment for premature infants; a registered nurse and preferably one with special training in the care of premature infants in attendance at all times; no member of the nursing staff that cares for premature infants may attend other patients who may have infectious or contagious diseases; one incubator for every 10 or less bassinets; a nursery equipped with means for maintaining a constant temperature of 75° to 80° F., and with some means for humidifying the room up to 55 or 65 per cent; hospitals accepting a premature infant born outside the hospital must provide a suitable nursery and isolation facilities on the pediatric service for its care, and the hos-

pital shall be provided with a portable incubator for use in transferring premature infants from the home to the hospital.

It is recommended that all hospitals refer the cases hospitalized under the Obstetrical or Pediatric Consulting Services to local public health nursing organizations so that the home may be prepared for the patient's arrival and so that there may be nursing supervision of the patient in the home.

SUMMARY

1. A program of clinical consultations in obstetrics and pediatrics and of hospital care services is being carried on by the Connecticut State Department of Health in coöperation with the Connecticut State Medical Society and the

Connecticut State Hospital Association.

2. The services are limited to patients of borderline economic level, living in towns of less than 50,000 population.

3. Qualifications for consultants are specified.

4. The consultant is called directly by the attending physician.

5. The consultant is paid a nominal fee.

6. The financial eligibility of each case is determined by the family physician.

7. Hospital care may be recommended by the consultant.

8. Hospitals approved for care must meet certain requirements.

9. In certain instances it may be necessary to investigate cases hospitalized.

Objectives of Regular Child Health Supervision*

Are they being met by the average child health conference?

AMOS CHRISTIE, M.D.

*Department of Pediatrics, University of California Medical School,
San Francisco, Calif.*

INTENT though we may be on the present international situation, nothing would be more shortsighted than for us to neglect or retreat from a program of child health. In the long run, this program is itself related to the proper preparedness of our population of the future. I think I should remind you that the recent history of both the acceptance of public responsibility and the rapid expansion of child health activities are in many ways the direct outgrowth of the last war. Physical examinations of recruits and draftees then were so completely disillusioning concerning the health of our youth that in 1921 the Congress passed the Maternity and Infancy Act (the so-called Shepard-Towner Act). In many rural communities, child health conferences were thus established, school health work was stimulated, and people enjoyed for the first time the advantages of a publicly supported program for better care for infants and children. For a multiplicity of reasons which would not be within the scope of this paper, the provisions of the Act were

not extended, but much constructive work had been accomplished and it was just a question of time until in 1935 the Social Security Act became a law of this land.

Now we are confronted with another conflict. It now seems time to build tanks and cannons instead of healthy minds and bodies. During such times there are usually no signs of retrenchment as far as provisions for child and maternal health activities are concerned, but there is also little opportunity for expansion. Yet we, as educators, have as a duty to our country to provide training for surgical technicians in the field of traumatic surgery and to provide training for better care for infants and mothers. It is too soon after our White House Conference on Children in a Democracy to start talking solely of children in a martial state. Let us hope that the same factors which caused our tremendous spurt as the result of the last war are now operating. Let us be ready for them again and avoid the pitfalls of the Shepard-Towner days. It is, therefore, a time for analysis and redefinition of objectives—a time to re-evaluate in the hope that when expansion comes we will know our problem, our deficiencies, and thereby be that much closer to the goal.

* Read before the Maternal and Child Health Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

OBJECTIVES OF THE CHILD HEALTH CONFERENCE

The child health conference should serve as an educational center for the physician. As conditions permit he should use it to acquaint himself with the application of certain teaching technics, such as the details of habit formation and procedures for prophylaxis of communicable diseases. The physician should evaluate the modern teaching of preventive pediatrics and thus carry to his own patients methods for improving health by preventive means. This objective if accomplished makes the physician an integral part of the program. It will counteract a mistake of Shepard-Towner days.

The conference also provides an educational experience for the nurse, which in turn prepares her to do a better teaching job. It gives her an opportunity to evaluate her teaching methods. The correlation in the conference of various elements of her work such as nutrition, mental hygiene, and dental health, should be among her aims.

Finally, the child health conference should be a place where parental education is done by physicians rather than by lay magazines or by poorly informed relatives and neighbors. The resort to magazines and pseudoscientific programs is at least in part due to neglect by the medical profession properly to educate itself and the people in sound principles of nutrition and prevention of disease. It is here then in the child health conference that the individual child is appraised and deviations from normal growth and behavior are noted. The parents should be informed of any such deviations, and corrective measures should be instituted by the family physician. Parents should be given an opportunity to gain a better understanding of the minimum physical and mental requirements of a growing child and of methods for coping with changes that occur as the child grows older.

This objective, if accomplished, is the giving of service. Too much emphasis however is frequently placed on this point and not enough on the educational objectives mentioned above.

These then are the objectives, clearly stated, and to which all of you will subscribe. Are they being met by the average child health conference today? The answer is an emphatic "no!" But should we be discouraged because we cannot meet them except in isolated areas and cases? This answer is likewise an emphatic "no!" What we need more than anything else is the patience, factual knowledge, and ability to work harder in order to get these objectives over to the ones who have been carrying and always will carry the ball—the practising physicians who conduct the conferences. To do this, I will discuss under several headings the problem of getting these objectives over to the practitioner.

PERSONNEL

Those of us intimately engaged in the teaching and practice of pediatrics and child health service are definitely of the opinion that special training is necessary in order to perfect oneself in the technics of health instruction and methods of the child health examination. This does not mean that the work can be done only by members of the American Board of Pediatrics. Two and seven-tenths per cent of board members practise in rural areas, yet many more babies are born in rural than in urban areas. We could not begin to train a sufficient number of pediatricians to do the work on even a part-time basis. It therefore seems an entirely sound principle, particularly in view of the possibility that with expansion the general practitioner will eventually be involved in the problem of medical care of the needy sick, to train this practitioner to do the work. He should be prepared to make some extra effort in

this regard by familiarizing himself with a number of standard publications on infant and child care and the examination of the child. The urologist and the nose and throat specialists have their special technics. The health examination is our special technic and it takes special training in order to do a good job.

How, then, may the general practitioner acquire these technics? Two methods seem useful—postgraduate refresher courses in clinical pediatrics, and the adequate utilization of the specialist.

POSTGRADUATE EDUCATION

The medical education in the United States is an excellent one, but is not without growing pains. As medical specialization has grown, medical practice has become more complex and the basic requirements for becoming a good physician have been steadily broadened. It has been shown that unless a physician makes some special effort to take postgraduate training within 5 years after going into practice, he will probably never make the attempt.

For various reasons postgraduate medical education in the past has been most ineffective. Up to very recently it was impossible for a western physician to obtain courses in the technics of child health supervision west of St. Louis. The cost of setting up a postgraduate course in clinical medicine at medical centers is often great. The expense to the physician student of remaining away from his practice for a sufficient period is another factor. The lack of understanding by the academician of the problem which confronts the general practitioner often makes the teaching ineffective. Finally, there has been lethargy on the part of the medical profession in the recognition of the needs and benefits of adequate postgraduate medical education. Certainly state university medical schools are not

fulfilling their complete function if they do not make the facts developed at medical centers available to all physicians. Medical education like other forms of adult education cannot be delivered in large massive doses and then discontinued. It must be a continuous thing; it is "lifelong learning."

And so in the improvement of child health service, considerable thought and energy must be put into postgraduate medical education. This must be along lines of developing centers easily accessible to the practitioner. I do not mean the traveling 2 or 3 day clinics, but intensive 2 to 4 week courses in technics of child health examination. Such instruction can only be tolerated in wisely administered doses. Consequently, it should be a continuous process and it should be followed by a "circuit rider" type of extramural postgraduate course which is done with the county medical society or in consultation service with the physician in his own office.

UTILIZATION OF THE CHILD SPECIALIST

Public officials in the health field have about arrived at the realization that if the quality of child health services is to be maintained at a high level, there must be continuous supervision. This cannot be done solely by the administrator and surely not by the "arm chair" director. The services, on a full- or part-time basis, of the specialist to carry out this supervision must be employed. This is true not only because the future may see expansion into the field of medical care for the needy sick but also because the child health program is essentially a clinical one. The general practitioner bears and will continue to bear the brunt in the clinical program, but he needs the help and continuous supervision of the child specialist. Let the pediatricians and public health personnel guide the physician and lay people in these efforts. Many state departments have already added

to their staffs such a consultant or adviser on a full- or part-time basis. Obviously for the county unit this will not always be practical but here again the county health officer will find himself more and more in the clinical field of medical care. I believe the days of the "arm chair" health officer are numbered. Beside his administrative duties he must also acquaint himself with the facts and technics of child health supervision. He must also have access to postgraduate courses where he may refresh himself in these technics. I believe that the training of health officers for rural areas should be directed more along clinical lines. An experience in both intramural postgraduate work and in "circuit riding" has convinced me of the necessity of clinical training in pediatrics if we expect more than lip service to the child health program from many appointees in public health offices. The promotion of a program is best accomplished by a health officer who by reason of his knowledge of clinical medicine can be of positive assistance to the practitioner in his clinical problems. He is then ready to assume a more militant rôle with the practising physician in his supervisory capacity of attaining the objectives of child health supervision.

CONTENT OF THE PROGRAM

A. Eligibility for the Child Health Conference—It is my opinion that in rural areas there should be no economic regulations regarding attendance at well child conferences. Any such regulation will inevitably destroy the purpose of the conference by stigmatizing certain groups. The underprivileged will not attend the conference if thus stigmatized, and it is this group which can gain the greatest benefits from it. In many communities parents who can afford to pay for well baby service have not yet learned to appreciate this preventive service and therefore will not

pay for it. Since it is primarily educational in its scope, I believe every parent, regardless of economic status, who has a well child below the age of 6 years, should be eligible. The only exceptions should be parents whose children already are receiving routine health supervision by their private physician, unless this physician requests consultation service at the conference. If it is known to all physicians that the conference is educational and preventive in nature, there is no reason why they should object to another physician examining their patients during the course of the conference. When the private physician realizes that any defect found in such a health examination will be referred to him for correction he will usually welcome the consultation service. Furthermore, there is an actual increase in pediatric practice in many localities after the education of parents has demonstrated the value of the health supervision program. The health supervision of a child should, of course, have continuity, and it is important that the information in the possession of the private physician and the conference be available to both, when both are interested in a child.

It might be well to recall that in these times of economic stress there are many parents whose health budget allows for calling a physician only when a child is sick. The only preventive service available to them is that provided by child health conferences. This service to parents carried out in the child health conference is an important link in our whole preventive medical program. It is obvious that police protection, fire protection, parks, and school systems are not limited to any one group. Preventive medicine, because it is community-wide, therefore cannot be limited to the medically needy if it is to achieve its goal. This is particularly true in rural United States.

Eligibility for attendance at the child health conference might have to be established on the basis of the general philosophy of the community where it is conducted. The pressure of public opinion and the viewpoint of organized leadership, such as the medical societies and lay groups interested in child welfare, must be considered. It is of the greatest importance that the sanction of the medical society should be obtained on this point.

It is not sufficient merely to establish child health conferences and provide personnel for them. Administering authorities should recognize a fundamental principle underlying this service, which is the establishment and preservation of the personal relationship between physician, child, and parent.

I therefore strongly advise that the child health conference in rural areas where the medical service is limited should be open to all regardless of socioeconomic rating, and I speak not only as an academic person but as one who has actually sold this idea to the profession.

B. Services Available at the Conference—Although the services to be rendered at the child health conference are preventive and have to do mainly with maternal education, the program must include formula regulation; solid food additions; the accessory food substances must be prescribed; immunizations at least against diphtheria and smallpox must be carried out; and habit training emphasized. Habit training is usually omitted in the average child health conference and it is particularly important for the preschool child.

C. Number of Children Attending—The attendance at any conference is dependent to a large degree on the effectiveness of the nurse's contacts with the parents. Too much emphasis, however, should not be placed on quantity in evaluating the work of the nurse; quality is of more importance

and this cannot be obtained when the conference is too large. An appointment system works well in the child health conference, and the nurse is responsible for seeing that it runs smoothly. Each conference should be planned so that there will be no unnecessary duplication. The appointment system limits the attendance to the number that can be given satisfactory service, and it insures that in a limited time each mother shall get her allotted period.

Too many appointments should be avoided. The physician will fulfil his part of the educational work better if he does not have too many children to examine and if the session is not too long. The speaker believes that 2 hours should be the maximum period for the physician doing child health conference work, and that an average period of at least 6 minutes should be allowed for each examination—including recording and the talk with the parent.

The frequency of attendance is a matter entirely dependent on local conditions. A standard often set is that every well baby should be seen each month until he is 9 months of age and every 3 months thereafter until 2 years of age. From 2 to 6 years of age it is usually considered sufficient for well children to have examinations every 6 months.

In certain communities it will be impossible for mothers to bring small infants to conferences without also bringing two or even three preschool children, and some conferences meet this situation by admitting both infants and preschool children. It is desirable that 60 to 70 per cent of the attendance in this type of conference should be infants and preschool children under 2 years of age.

Occasionally the attendance will take a sharp drop. If this should happen for three consecutive conferences, a study of the situation may reveal an

obvious reason—inclement weather, for example. Again, the reason may lie in the personnel. While it is true that a great deal of the success of any conference depends on the nurse, all the responsibility is not hers. A disinterested or poorly informed physician may be the one who antagonizes the mothers and who is not giving them what they want and need, in spite of a capable nurse. Before discontinuing poorly attended conferences, changes in the conducting personnel might be considered.

D. Services to the Physician—The nurse is responsible for the smooth running of the conference, for making appointments for return visits, and for acquainting the conducting physician with the social and medical facts she has learned in her home visit or during previous contacts with the mother.

An excellent method of informing the physician about pertinent facts is to record these on the infant's chart. Such remarks as "child wetting bed," "cannot afford sufficient milk," or "child refuses cod liver oil," for example, will give him an insight into the psychological or social situation and a lead for him to follow up in regard to habit formation, which would be unobtainable otherwise.

If immunizations are performed at the conference, the nurse will assume responsibility for obtaining permission from parents. She will prepare needed materials, prepare the areas for inoculation, and keep records. Any skin rash or upper respiratory infection or a rectal temperature above 100° F. is a contraindication for any immunization procedure. Complicating rashes or reactions may endanger the entire immunization program.

The assisting nurse will see that the child enters the examining room undressed. Children under 2 years of age should be completely undressed. Panties or bloomers may be left on for the older children. The nurse will also assist the

physician in securing the cooperation of the child. This will facilitate a better examination.

The time of the conference will depend on the convenience of the conducting doctor and the hour that local mothers can attend. If the physician is paid for his time he will be more apt to be regular and prompt.

Occasionally a medical emergency will arise, in which case the physician should secure another physician to take his place. Plans for an alternate whom the nurse can call in case of illness or other unavoidable circumstances is a satisfactory arrangement.

SUMMARY AND CONCLUSIONS

The greatest need for the establishment of child health supervision is in rural communities. Studies have shown that only 37 per cent of preschool children in these areas have had even a single health examination. At least 51 per cent of urban children have had this advantage.

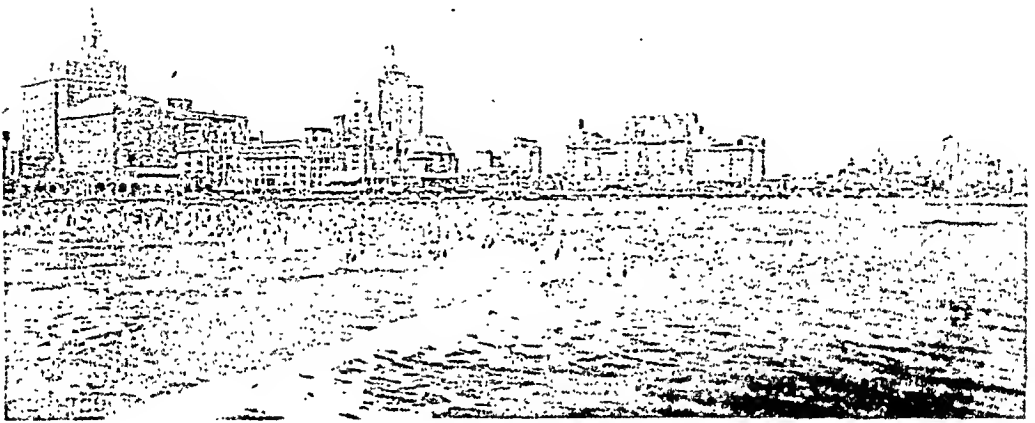
Much has been accomplished since 1935 to meet this need. State departments of health established 522 new permanent child health conferences in 1939, making a total of 2,394 centers in 41 states where conferences were conducted by physicians at least once a month.

However, we have fallen far short of meeting the true objectives of child health supervision. Maternal and child health directors and county health officers have an abundant supply of written material outlining these objectives, but the pediatrician, the health educator, and the public health nurse must work harder to teach the general practitioner how to put them into effect. Postgraduate education and the utilization of the specialist have been suggested as the best immediate means of accomplishing this.

Some points concerning personnel, clinical management, eligibility and con-

tent of the program for child health supervision have been discussed. In conclusion I think it is about time we were finding out what the parents, who are the recipients of all this service, are

thinking about our efforts. It may very well be that they could help us in our reevaluation and redefinition of the service. They may have some answers to our problems.



Atlantic City, N. J., Skyline

An Assessment of the Nutrition of a Rural Population in Tennessee*

JOHN B. YOUMANS, M.D.

Department of Medicine, Vanderbilt University Medical School, Nashville, Tenn.

THE assessment of the nutrition of populations is a public health procedure. The primary object is not a study of the intimate nature of nutrition or the mechanism of disease due to nutritional deficiency. Neither is it concerned with sporadic cases of nutritional disease. Such cases are problems for the individual practising physician. Instead, studies of the nutrition of populations deal primarily with the incidence of deficiency disease, with its epidemiology, with "modes of transmission" which may be the effects of habit and custom, with etiology in so far as the cause is common to large groups of the population, and finally with problems of prevention.

An assessment of nutrition is to be distinguished from a survey of nutrition of which it may be a part. A complete survey of nutrition includes both a study of food consumption and an assessment of the physical state of the population. Both the study of food consumption and the assessment of nutrition can be accomplished in a variety of ways depending on the object in view and the facilities which are available. Thus the food consumption of a popu-

lation may be determined merely from records of production and of imports and exports, and the nutritional state of the people estimated from a report of deaths due to malnutrition. Or, a small group may be studied in great detail with regard to both food consumption and the physiology of their nutrition.

For public health purposes a complete survey is very desirable. Until the present time the greater emphasis has usually been placed on the dietary study. This has been used not only to find out what and how much people ate but, by inference, the nature and frequency of disease due to dietary deficiency. In other words, the dietary survey has been used to assess the state of nutrition of the subjects. Such studies have yielded very valuable information. However, the method is indirect and inadequate for measuring the state of nutrition according to present-day standards. The reason for this use of the dietary study was the lack of satisfactory methods of examination for assessing the physical state. For the most part, these were the detection of the symptoms and physical signs of gross deficiency disease and such relatively crude measures of nutrition as the body weight, height, and similar anthropometric measurements. While such methods may have been sufficient at an earlier stage of our knowledge of

* Studies referred to herein are being conducted under the auspices of the International Health Division of the Rockefeller Foundation, New York, N. Y. Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

nutrition, with the increasing recognition of the importance of subclinical or minimal deficiency states they were no longer adequate and a better procedure for assessing the nutritional state of a population was required. Such procedure should make possible an objective measurement of the nutrition of individual subjects with respect to individual factors of nutrition, in line with modern concepts of nutrition and nutritional deficiencies and with particular reference to mild or subclinical deficiency states.

While such methods of examination would be expected to give an objective measure of nutrition, independent of a record of dietary consumption and without certain drawbacks and errors of the latter procedure, it is not to be expected that food consumption is to be neglected. Dietary surveys are an important factor in determining the etiology and epidemiology, as well as certain social and economic aspects of nutritional deficiency, and for many public health purposes the complete nutrition survey, including both a study of food consumption and an assessment of nutrition will be required. The extent and type of the two studies will be determined by the purpose of the survey and the facilities available for it.

Within recent years much progress has been made in the development of suitable methods and tests for assessing nutrition and it seemed to us the tests now available would permit the assessment of the nutrition of a population as a public health procedure in terms of our present-day concept of nutrition and nutritional deficiency. We therefore began such a study with the dual purpose of developing a method suitable for public health purposes and demonstrating its effectiveness. For the reasons just given, the study is a complete nutrition survey including both a study of food consumption and a measure of the nutritional status of a population.

EXPERIMENTAL PROCEDURE

An area in middle Tennessee, predominantly rural and containing some 2,500 subjects, of whom about one-fourth are colored, was selected. Although variations exist within it, economically and socially it is considered to represent the average of the region. Statistically the study is made on a "universe" basis, that is, with the intention of examining every inhabitant in the area, although the study could be made on a basis of sampling, as well.

The record of food consumption is obtained by competent field workers on a family and individual basis using a week's inventory record for the family and three separate day periods of that week for each individual's consumption. Pertinent social and economic data are secured with the record of the diet.

The assessment of the physical condition of the subjects is made by a full medical history, a complete physical examination with particular respect to the signs of deficiency disease, and certain laboratory tests designed to detect not only frank cases of deficiency but the subclinical or latent forms as well.

The medical history and the physical examination are obtained and made by experienced physicians who have had special training in the diseases of nutrition in both children and adults. Certain simple anthropometric measurements are included. The examinations are made either in the home, in specially equipped quarters in the schools of the area, or at the Vanderbilt University Hospital.

LABORATORY TESTS

The laboratory tests include (a) a test of visual adaptation to dark using Hecht's adaptometer, (b) the concentration of vitamin C, and that of inorganic phosphorus, calcium, and phosphatase in the blood, (c) the total serum protein, serum albumin and globulin, and (d) the red cell count,

hemoglobin and hematocrit determination. In addition, vitamin B₁ excretion in the urine, the concentration of vitamin A in the blood, a bacteriologic test of free nicotinic acid in the blood, a measure of prothrombin concentration as an index of vitamin K deficiency, and a slit lamp examination for evidence of riboflavin deficiency have been done on a large number of the subjects.

An anterior-posterior x-ray of the wrist and a lateral of the ankle are made at constant distance and milliamperere seconds with voltage varied according to the thickness of the parts. A graduated aluminum wedge is included in the film, and the density of bone measured with a photoelectric cell densitometer against a constant source of illumination. The usual clinical interpretation of the roentgenogram is made also.

It will be seen that these tests measure nutrition with specific respect to vitamins A, B, C, D, and K, nicotinic acid and riboflavin, protein, and iron as far as it is reflected by the red cell count and hemoglobin concentration. Calories are measured by a record of the diet and general nutrition, growth and development by physical measurements and the x-ray examination.

For the blood tests 30 ml. samples of blood are drawn under suitable conditions and properly preserved. All laboratory tests, the x-rays, and adapter tests are made at the Vanderbilt University Hospital. A complete study is made of each subject twice during the year, in a summer-fall and winter-spring period, presumably periods of optimum and minimum nutrition respectively.

It is realized that some of the tests may be unnecessary or non-informative and that the reliability or suitability of others may be in doubt. Time will not permit a discussion of the reasons for the selection of each of the tests or the details of the methods and standards.

It was felt that in initiating a study of this kind certain tests which have been used or suggested in the past should be included for the purpose of determining their value and usefulness while newer tests of promise should be given a trial. Also it is believed that certain data, while not susceptible of final interpretation at the present time, will in the near future be significant even though the methods and tests by which such data are obtained are altered before reaching their final form.

In such a study as this it is not sufficient simply to apply the procedures which have been selected to the examination of the subjects. Well established tests and procedures may need to be modified to adapt them to the particular conditions under which they are to be used, and the suitability of such modifications must be determined. Certain otherwise satisfactory tests have had normal values established only for certain groups of subjects, such as children, and need additional data to extend those normal values to other groups of the population. Still other tests, although they give every evidence of being valid and reliable have not had a use extensive enough to warrant final judgment and must be given further trial under carefully controlled conditions. Therefore, a series of parallel studies are being carried on to check further the reliability and suitability of the procedures which are being used and to develop new and improved methods. Finally, it is planned to check the results of the study, as far as possible by repeating the examination in certain selected groups and with proper controls after the administration of supplements of the various food factors.

RESULTS OF THE STUDY

To date, some 900 subjects have been examined, about 500 of them for the second time. The study is still in progress and only a preliminary analysis

of some of the data has been made. No final results or conclusions can be presented at this time. However, some provisional findings are of interest and may suggest at least some trends which the survey seems to disclose. For the most part the findings which I shall discuss are based on laboratory tests alone, unsupported by correlation with the dietary record or the physical examination, and are highly provisional.

UNDERNUTRITION

An unexpected finding is an apparently high incidence of a deficiency of calories or *undernutrition*. According to the standards which have been temporarily adopted, such a deficiency has been found in as high as 100 per cent of certain age groups though the groups are not large enough to make exact percentages significant. The standards are those of the "Table of Minimum Quantities of Specified Nutrients to Be Furnished by Grade A Diets of the American Classification," U. S. Department of Agriculture, Bureau of Home Economics. The data so far available are derived from the individual records and have not been compared with the family record nor adjusted to calculated individual requirements. It is, therefore, probable this deficiency is less frequent than it appears. Nevertheless, it appears that a high incidence of caloric deficiency will be found, and this preliminary indication is supported by the fact that there appears to be a much greater tendency to underweight than overweight in our subjects.

Cases of protein deficiency have been entirely confined to adults and older children and so far none under 3 have shown lowered serum proteins. Among the former, however, a rather large number, about 20 per cent, have shown a hypoproteinemia.

Anemia believed to reflect iron deficiency has been found almost entirely

in children and women. This supports the belief that iron intake is important only as a replacement for unusual blood losses and for requirements of growth, and that even a very poor diet will provide adequate iron for hemoglobin in the adult if there is no more than a normal loss of blood.

VITAMIN DEFICIENCIES

A high incidence of vitamin A deficiency, over 50 per cent, is indicated by the results of the visual test. In a considerable number of cases, however, the test readings fall in a somewhat questionable zone, and the results of certain additional studies suggest that other factors, such as age, may have influenced the results. Nevertheless, a sufficient number are so definitely abnormal that a considerable amount of vitamin A deficiency is indicated.

An incidence of vitamin C deficiency of about 20 per cent agrees fairly well with that found in other parts of this country in comparable studies. Distinct seasonal variations have been found with a definitely higher incidence in the winter-spring period. It is interesting that vitamin C deficiency is much more frequent in infants and adults than in children 3 to 15.

So far the evidence indicates a low incidence of vitamin B₁ deficiency, even of slight degree, a finding which agrees with general clinical observations in this area. This result is interesting because of the rather close general association in foods of vitamin B₁ and other members of the B complex. In contrast riboflavin, another member of the B complex, appears to be deficient with fair frequency, and pellagra which is related to another member of the B group, nicotinic acid, is known to exist endemically in the area.

As might be expected a low incidence of vitamin D deficiency has been found even in the winter-spring examination.

Finally, as evidence of the generally

mild nature of the deficiency states, it may be observed that no cases of frank, fully developed scurvy, beriberi, pellagra, or vitamin A deficiency have been encountered, and a relatively small number of cases of rickets and nutritional edema have been found.

CONCLUSION

In conclusion, I have indicated the public health nature of the procedure of assessing the nutrition of a population and described the methods which we have employed to make such an assessment. Certain preliminary results have been presented, but no attempt will or should be made to draw any final conclusions from them. They have been presented for what they are, incomplete, preliminary, partially ana-

lyzed data obtained by the methods I have described.

Although few cases of advanced or severe nutritional deficiency diseases have been found, let me warn that this fact should not lead to the conclusion that the milder deficiencies which have been found are unimportant. They are important and in many ways are more important than frank, fully developed deficiencies. To begin with the milder deficiencies are much more numerous, as our studies indicate. Less obvious, they remain unsuspected and their effects, including those which are remote and indirect, may be more serious. For the same reason they are likely to remain uncorrected unless studies such as I have reported disclose their presence and the need for correction.

Simplification of Records Through an Analysis of Procedures*

J. O. DEAN, M.D., AND MARION C. HENDERSON

*Surgeon, U. S. Public Health Service; and Associate in Statistical Research,
Children's Bureau, U. S. Department of Labor, Washington, D. C.*

MOST of you will agree that the record keeping required of public health workers is out of all reasonable proportion to the main function of our health organizations. The need for simplification does not have to be argued with you. We are interested now in how to introduce the requisite simplification without losing sight of the safeguards that must be observed when we try to substitute practices which are less costly in time and more helpful to personnel. It is the purpose of this paper to outline basic considerations in the development of a well integrated, convenient, and effective set of records.

During the past year, under the sponsorship of the Committee on Records and Reports of the State and Provincial Health Authorities of North America, and with financial aid from the Commonwealth Fund, the U. S. Public Health Service, and the Children's Bureau of the U. S. Department of Labor; a field staff directed by the authors of this paper has assisted eight states with their record systems.

In the states visited by the field staff it was evident that previous efforts toward a more effective use of records had been directed principally toward the mechanics of the system, the preparation of manuals, the arrangement of

forms, and the instruction of clerical personnel in the uses of the system. These efforts undoubtedly increased the utility of the records for local health department personnel. In the opinion of the authors, however, such measures do not strike at the heart of simplification of records.

Cumbersome record procedures, inept and needless forms, unnecessary duplication of information, vague understanding of the purpose of records, as well as the ineffective use of records, are essentially problems which can be corrected only by better management.

To remedy the ills of record keeping so that the system becomes a real asset to the ease and effectiveness of conducting an organization's work requires, as an initial step, an examination of the personnel, administrative functions, and structure of the organization that the records are to serve. While the importance of studying mechanics alone, particularly the details of item arrangement, size and number of forms, and the amount of handling of records required under the prevailing procedures, should not be underrated, the disadvantage of such a study is that it tends to regard the record system as something detached from the essential administrative processes of the organization—something which, like the automobiles used by field workers, can be repaired or exchanged without material influence upon the quality or amount of health department service.

* Read before the Health Officers Section of the American Public Health Association at the Sixty-fifth Annual Meeting in Detroit, Mich., October 8, 1940.

An examination of the mechanics of a system should be the last, rather than the first, part of an analysis of procedures aimed at the correction of problems. The inquiry should begin with a scrutiny of the program and the administrative structure of the organization as a means of determining the needs to be met. This should be done by getting those who direct or supervise a program to state the purposes of their activities and the relationship of special activities to the total program, together with a description of the procedures to be followed in achieving aims. If, as occasionally occurs, objectives are ill defined and the activities are carried on in a perfunctory and rather aimless manner, it is quite certain that the accompanying record practices will be equally meaningless. In the absence of purposeful activity or of some well defined and acceptable aim, there can be no justification for a record since its rôle is to expedite achievement of these very things. The determination first of the existing needs has the advantage of bringing to light those records that have no defensible use or those that are inappropriate for the program they are intended to serve. In illustration of this point, consider, for example, how the need for a student health record is related to the characteristics of the school hygiene program. A program having as its principal objective the periodic physical examination of each student would have few, if any, record requirements in common with the department whose program embraces dental corrections, immunizations against smallpox and diphtheria, and the placing of each child in the hands of a physician when deviations in physical or mental health are observed by the teacher or nurse. In the former instance, it is doubtful if anything more than a list or tally is required. In the latter instance, provision needs to be made for the recording of observations

and services for each student by at least three types of personnel.

Administrators have felt that many of their records were impracticable, when, in reality, they were well suited to the proper conduct of the work. The difficulty was not in the records but in the staff members' lack of acquaintance with the aims of the department and the detailed procedures they were expected to carry out. Under these circumstances any carefully planned set of records, no matter how well integrated, is likely to seem needlessly complex and lead to the keeping of records as an end in itself rather than as an aid to easier and more effective work. The answer, of course, lies in the expansion of in-service training activities and not in a change of records. It should be emphasized here that most record problems originate in the inadequate provisions made by health administrators for teaching their staff the duties each member is to fulfil in a given program.

Furthermore, the difficulties arising from lack of knowledge of staff workers, which contribute to needless record keeping, are reflected in the attitude many of them have toward records. Notes and entries are frequently made which are of no consequence in furthering the purposes of the organization. Again, the explanation probably lies not in the record system but in a neglect to teach the workers that entries on a record should be governed by a decision as to their usefulness. Unless the entries permit a quality or a volume of service that otherwise would not be given, the time spent in recording notes should be used in other ways. Thus, it is only as a record system is reviewed in relation to the attitude and knowledge of the workers who are to use it, and in relation to local administrative needs, that many of the factors complicating the satisfactory operation of the system will be uncovered.

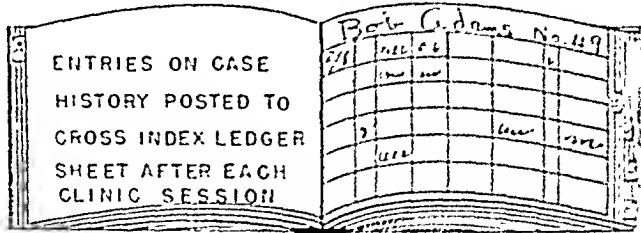
The more detailed consideration of

ORIGINAL PROCEDURE

5



1600 CLERICAL
OPERATIONS EVERY
WEEK.



6



ONCE, A WEEK
CROSS INDEX LEDGER
SEARCHED FOR
DELINQUENT PA-
TIENTS

5000 CLERICAL
OPERATIONS.

7



NAMES AND FILE
NUMBERS OF DE-
LINQUENT PA-
TIENTS WRITTEN
DOWN AND GIVEN
TO FOLLOW-UP
WORKERS

8-9-10



CURRENT PATIENT LOAD
TALLIED EACH MONTH
FROM CROSS INDEX LEDGER

NUMBER OF CURED AND NUM-
BER OF DELINQUENTS
TALLIED EACH MONTH

TOTAL TREATMENTS
TALLIED EACH MONTH

20,000 CLERICAL OPERATIONS

11

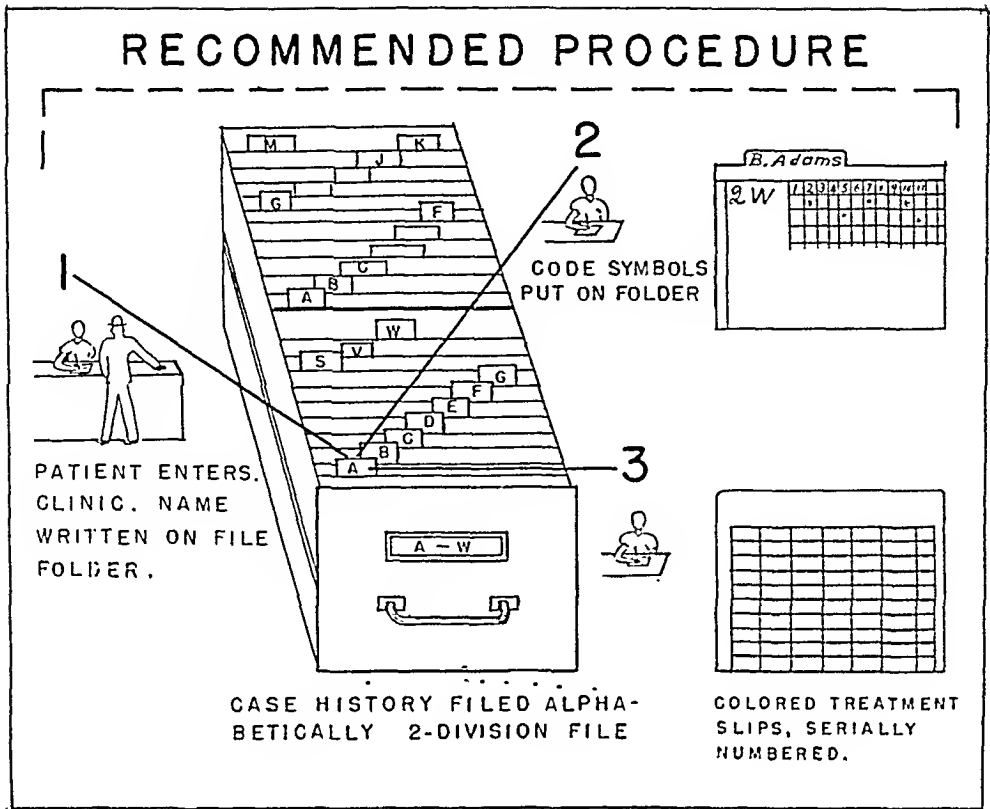


CLINIC
MONTHLY
REPORT
PREPARED

form of a loose-leaf ledger, is pictured opposite procedure No. 5. For each clinic patient having a case record there was a corresponding cross-index record. Information regarding the type of treatment given was posted each week from the case records to the respective cross-index records. Since there were about 1,600 active cases in the clinic a corresponding number of clerical operations, consuming 15 hours of clerical time weekly, were involved in this duplicating procedure. At the end of every week the cross-index ledger was searched for the names of patients who had not reported for treatment. This necessitated inspecting each one of some 5,000 records since the cross-index contained the names of inactive as well as active cases. This procedure, together with the preparation of a list of delinquent patients for the follow-up service, required between 3 and 4 hours of clerical time each week. The monthly clinic

report calling for various types of information was prepared by thumbing through the cross-index ledger at the close of the month and making a series of tallies. Over 20,000 clerical operations and 30 hours of clerical time were involved in this procedure. Altogether the work of maintaining the cross-index, of finding who the delinquent patients were, and of preparing the monthly report accounted for approximately 100 hours of clerical time a month. The work was distributed unevenly over the month and workers who were responsible not only for this clerical work but also for follow-up on delinquent patients were often handicapped in dealing with urgent cases.

By relatively minor changes, involving principally the rearranging of filing procedures and the writing of code symbols on the outside of the case-record folder, it was possible to eliminate 6 of the 11 clerical procedures



involved in this set-up and to provide the essential information sought by the clinic director.

The follow-up workers were released from approximately 70 hours of clerical work, and their remaining clerical duties were evenly distributed throughout the week and month.

Essentially, the change involved the re-filing, after each clinic session, of case records in a separate section at the back of the complete clinic file. Thus, at the end of a week the only records remaining in the front part of the file would be those for delinquent, discharged, or "vacation" cases. Colored slips of paper designating the treatment received by each patient attending the clinic, together with information recorded on the front of the case folders, permitted a convenient and satisfactory enumeration of each month's activities. The former time consuming operations resulting from

transcription of information and repeated inspections of the same records were thus eliminated.

Probably the most frequent shortcoming encountered in analyzing a record system is the lack of integration of various records comprising the system. In designing record forms there is a strong tendency on the part of administrative personnel to think in terms of the problems or activities in which they are primarily interested, rather than in terms of the persons doing the work, who are usually not permitted to confine their efforts to a single type of activity.

This shortcoming has frequently led to the separation of information pertaining to the same person, household, or premises as, for example, using separate files for medical, nursing, and sanitation records. If there is not a large amount of duplicate information on several records, reviewing all data

available for a given person or family when the need arises, becomes very tedious. While the directors of services and of supervising personnel speak of integration of services and of teamwork, the physical basis for realizing these aims, in so far as the records are concerned, hampers if not defeats their achievement. This will continue to be a problem until records are designed with the whole picture of health department aims in mind instead of those for each special activity.

We could recount many examples of how the services given by professional staff members can be facilitated by eliminating the separate recording of various types of activities. It is not, however, our purpose to relate them in detail but to point out that weaknesses can be discovered if there is a desire for efficiency on the part of administrators.

Another measure for simplifying records requires a perusal of the files to learn the frequency with which combinations of services have occurred. For example, if the majority of mothers and children admitted to nursing service have also been admitted to medical conferences, then worth while savings in the time necessary for copying information from one record to another may be effected by combining the two records. On the other hand, if relatively few of the nursing admissions are clients of the health department's clinic, very little effort is lost by having separate forms, although a consolidation of forms within the nursing service

would be an alternate possibility deserving of serious consideration.

SUMMARY

The need for a record hinges upon three factors: (1) aims, (2) work procedures, and (3) structure of the organization. Among health departments these factors are markedly varied, and consequently the records which are well fitted to the needs of one organization are frequently ill adapted to the administrative requirements of another. The tendency of health administrators to copy the record system of other departments has been responsible for much of the unnecessary and fruitless paper work now prevalent. An additional cause of needless record keeping is the neglect to acquaint staff members with the administrative need behind each record they are required to maintain.

A necessary measure for relieving public health staffs of excessive record keeping is to design records to fit the needs of the particular organization in which they will be used—that is, use a "tailor-made" in place of a "custom-made" system. This involves a clear definition in the minds of all staff members, both new and old, of the aims of the department and of the work procedures to be followed in pursuit of those aims. Further simplification of record keeping rests upon a study of the sequence of operations and the time required for each, and finally upon a study of the possible alternate courses for eliminating or reducing needless steps.

What Can the Dental Health Worker Teach Regarding Nutrition and Diet?*

WILLIAM R. DAVIS, D.D.S., F.A.P.H.A.

*Director, Bureau of Public Health Dentistry, Michigan Department of Health,
Lansing, Mich.*

THAT there is great need for judgment, discrimination, and careful statement in dental health teaching is very evident because of the many conflicting statements which occur in the literature. What is the health worker or the public to believe about nutrition and diet? Unfortunately, statements of opinion or theory are often given as facts, or are soon repeated as facts, and it is hard to overtake these statements, even when competent research has proved them to be false. Thomas Huxley once said: "There is nothing more tragic than the murder of a big theory by a little fact and nothing is more surprising than the way in which a theory will continue to live long after its brains have been knocked out."

It should be understood at the outset that the writer is not and never has been a research worker in nutrition or dental histology, pathology, or bacteriology. After some years in private practice, he has been for more than 20 years employed in public health dentistry. His task is to keep informed concerning the results of research as it pertains to dental health, evaluate this as best he may, and interpret it for the benefit of his public health coworkers and the general public.

* Read at a Joint Session of the American School Health Association and the Food and Nutrition Section and Oral Health Group of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1949.

Commercial advertisements are guilty but they are not the only offenders. Last year a dental committee examined the dental content in about 80 textbooks on health intended for use in schools, but did not find one text wholly acceptable, and most had much false teaching in regard to teeth. The writers have not been entirely to blame. Dentists, dental health workers, and dental research workers have all been too prone to make positive statements which should have been qualified.

The relation of nutrition to dental caries first came prominently to the attention of health workers and research investigators with the work of Percy Howe in Boston and May Mellanby in England some 20 years or more ago. Howe's experiments on rats, guinea pigs, and monkeys, and Mellanby's on dogs seemed to show a distinct relationship. Experiments in this direction were soon being carried out in a number of laboratories. Research workers grasped this lead in the hope that here at last in the field of nutrition might be found the means of preventing the ravages of dental decay.

There is not time and it is not necessary in this paper to give in detail the results of these investigations. We shall select only a few opinions from those most often quoted, typical of the wide divergence.

Howe¹ has maintained that vitamin

C is the most important protective agent and that dental caries is retarded by use of a fortified diet in which vitamin C is high and cereal intake low.

Mellanby² believes vitamins D and A and mineral salts most important, especially calcium and phosphorus, along with a reduction of carbohydrates.

Hawkins³ of Los Angeles reports arrest of caries with an adequate diet well fortified with fruits and green vegetables but low in cereals and sugar. He believes this due to increase in alkaline elements in the saliva and that the acid base and calcium phosphorus balances are most important. Martha Jones⁴ of San Francisco agrees with Hawkins and believes that excess of alkali elements over acid is the controlling factor.

Boyd⁵ of Iowa University believes that "complete and optimum nutrition offers the teeth full opportunity to resist destructive agencies."

The Michigan group⁶ (Bunting, Jay, and coworkers) emphasize the rôle of *Lactobacillus acidophilus*. This group claims that a close diagnostic relationship exists between oral lactobacilli and dental caries activity, and that the consumption of carbohydrate, particularly refined sugar, favors the growth of lactobacilli in susceptible individuals, thereby stimulating caries activity.

We have thus listed briefly the theories that are being advanced today as to the rôle of nutrition or diet in the cause or control of dental decay.

It will be seen that these emphasize the following as most important: vitamin C; vitamins D and A; calcium/phosphorus balance; alkali/acid balance; optimum nutrition; reduction of the carbohydrate intake, especially sugars.

At first glance this looks like a very confusing picture, but is there not some common denominator, or are there not some points on which there is practical unanimity of opinion? We believe that such is the case.

In the first place, we can say that there is very general agreement today as to the nature and course of dental caries as set forth more than 40 years ago by Miller, an American dentist in Berlin working in the laboratory of the renowned Koch. Fosdick and Wessinger⁷ of Northwestern University say that "at the present time most research workers believe that it is a chemical bacterial phenomenon and that systemic factors merely contribute to or alter the local environment," that is, acid formed by the action of certain organisms on carbohydrate dissolves the mineral content of the enamel and dentine to cause decay. This was Miller's conclusion.

For the practical purposes of this paper we can omit the discussion as to which organisms are the most important in this process. It is interesting to note, however, that Becks and Wainwright⁸ of the University of California report experiments made last year upon a large group of students to test the theories of the University of Michigan group and report complete confirmation as to the rôle of lactobacilli and carbohydrate. Waugh of Columbia, who has made many trips to Labrador and Alaska to examine the teeth of Eskimos, reports decay unknown as long as the Eskimo subsisted on the native diet, but when he eats "civilized" food, decay soon becomes rampant. He gives the three exciting causes as refined wheat flour, sugar, and molasses. He describes his researches very interestingly in a recently published radio address with the heading, "An Unsweetened Tooth Cannot Decay!"⁹ It is also interesting to note that Waugh started out with the conviction that an optimum diet was the important thing, but these studies caused him to change his mind. The researches of Price on native peoples would also bear out Waugh's conclusions. Fosdick¹⁰ reports the rapid production of acid on susceptible tooth surfaces within ten minutes

after the ingestion of a candy bar. He concluded from this observation that the acids of caries were produced almost as soon as the candy was taken into the mouth.

We find too that in the experiments carried on by those claiming vitamins A, C and D, calcium/phosphorus balance, alkaline base, and optimum diet as the important factors there has been in every case a reduction of the carbohydrate intake. Some of these investigators reduced the carbohydrates not because they believed it important in the control of caries, but because they believed it necessary in order to have other important foods eaten in proper amounts. The candy and cereal crowded out other necessary items. Boyd says, "It is important to recognize that the amount of carbohydrate eaten daily by the average child is considerably in excess of that we prescribe for normal child nutrition." In fact, the statement has been made that no research group has ever controlled caries in the human subject on a high sugar diet.

Jay¹¹ calls attention to the National Confectioners' Association which has distributed literature throughout the land citing a rat experiment in which high amounts of sugar in the diet failed to cause carious teeth, with the inference that sugar is not harmful to human teeth. They failed to tell the whole story. Research on rats¹² has shown that for them the important factor in producing caries is fine or coarse food. A diet of the highest nutritional value to which has been added some coarsely ground corn or rice resulted in caries in all the rats that ate it. The addition of sugar increased the rate of decay. A diet which lacks the bare necessities of life will not produce caries in the rat if it contains no coarse particles. The high sugar diet fed to rats reported by the Confectioners' Association contained no coarse particles. It is not always possible to draw conclusions for

the human being from animal experiments alone. There may be factors which are very important in one case and not in the other, as this research well shows.

We see then that there is at least one common denominator in all the research that claims reduction of dental caries in man by dietary means, and that is the reduction of carbohydrate, especially in the form of refined sugar. Evidence is increasing every year in this regard. Here in this instance the old adage repeated for centuries has proved to be correct. Nina Simmonds¹³ reports Aristotle, who lived more than 300 years B.C., as asking why soft and sweet figs damaged the teeth and also that Tolver in 1752 wrote: "All kinds of sweetmeats and sugar contribute very much to the destruction of the teeth."

We still have the apparent contradiction in the few people who can eat candy and sugar and yet do not have dental caries. The answer seems to be that the mouths of such individuals will not tolerate organisms associated with caries. Would that our research workers might find the cause and how to produce this immunity in others. So far their efforts in this direction have not succeeded. The number of such "immune" individuals is very small—perhaps not over 3 per cent.

Something should be said also in regard to the prevalent teaching today concerning the importance of nutrition for the expectant mother, both for her unborn child and all through life, in order to "build or maintain strong teeth." Such statements are made on assumptions which do not take into account the histology of tooth formation. The work of Kronfeld and Schour¹⁴ with the discovery of the neonatal ring shows that only a very little calcification of teeth takes place before birth, and that the outer portion of the enamel of deciduous teeth is not formed until after birth. They say there

is no evidence for and much against the importance of prenatal diet so far as the teeth of the expected baby are concerned. Of course an adequate diet for the expectant mother is very desirable for other reasons, but we should not attempt to secure this with statements that are not borne out by the facts. There are too many unfavorable reactions later from disappointed mothers, as many dentists can affirm.

In building well formed teeth the important time that diet can play its part is from birth to 8 years of age—14 if we include the third molars or wisdom teeth. Teeth are not like bone, capable of continued nutrition and self repair. After the crowns of teeth are once formed, Kronfeld¹⁵ says they "have just as good or just as bad a structure as they are going to have for the rest of their life." We know too that often children with the best quality of teeth have rampant decay, and again children with very poor quality have no decay at all. Mottled teeth caused by fluorine in the water is a case in point.

In view of these facts and our clinical experience, we believe that the idea of feeding teeth to improve their structure so as to prevent decay is questionable at any time and, after the teeth are once formed, simply indulgence in wishful thinking.

Here again the importance of an adequate diet for growth, development, and health is not questioned. We are only attempting to discourage statements concerning nutrition and diet in regard to teeth that are not in accord with present known facts. Of course we deplore but cannot prevent statements contrary to fact or in question from commercial organizations interested only in selling their products; but health workers, including those who write chapters for health textbooks or articles for lay education, should not be a party to this deception. We know that they do not do so intentionally

and we have all been more or less guilty in the past when we accepted statements that we supposed were true but which seem not to stand more thorough investigation.

We plead then for careful statements from all health workers. The public may expect exaggeration or misstatement from some commercial sources, but they look to the health worker, who should be unbiased, to tell the truth.

What then can the dental health worker teach in regard to nutrition or diet?

We believe he should teach the importance of a well balanced diet, such as is generally accepted today by competent nutritionists and physicians as important for general body growth, development, and optimum health. All health workers should lend their aid in emphasizing this.

We believe that he should say that the period from birth to 8 years of age is the time when nutrition can play its most important part in building well formed teeth, but he should warn against the idea that any known diet today can guarantee the building of teeth impervious to decay. He can say that a well balanced diet is important in treating or preventing some forms of gingival disease, such as scurvy.

We believe that he should discourage the use of proprietary preparations to supply the necessary calcium and phosphorus. These can best be supplied in a well balanced diet, as most investigators will agree.

We believe that he should teach the importance of the reduction of sugar and sometimes other carbohydrates for the control of dental decay and because the usual American diet is unbalanced by too much carbohydrate.

We realize very well, however, that if sugar is the great offender in the cause of dental caries, as seems to be the case, we have a very difficult task ahead in making much progress in its

control by the reduction of sugar intake so far as the mass of people is concerned. Most people would prefer some decay rather than to eliminate the sweets. The per capita consumption of sugar in the United States has increased something like 100 pounds per person in the past 100 years. But some will heed and some progress is being made, as is evidenced by many a story. We should keep up the admonition and give the evidence as to its harmful effect on teeth. At the same time, let us hope our research workers discover a more practical means of controlling or preventing dental decay.

In other words, we believe that, no matter what theory is accepted today as to the rôle of nutrition in dental health, from a practical standpoint we may all talk the same language.

Though this paper deals only with nutrition and the diet, we cannot refrain from mentioning the other factors in a good dental health program. Early and periodic care by a conscientious and competent dentist, starting at $2\frac{1}{2}$ or 3 years of age, cannot be overemphasized in the promotion of dental health under present conditions. Proper and regular use of the toothbrush is also desirable not because it will prevent decay, but because it can aid in reducing decay on

the exposed surfaces of the teeth, and also aid in maintaining healthy supporting tissues.

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Advances in Methods of Murine Typhus Control*

ROY J. BOSTON, C.E., F.A.P.H.A.

*Typhus Control Engineer, Division of Preventable Diseases,
State Department of Public Health, Atlanta, Ga.*

THE increasing widespread incidence of murine typhus fever in the United States, and especially in Georgia, has gained sufficient momentum to attract considerable interest as a major public health problem. A state-wide typhus fever control program for Georgia was organized by the Georgia Department of Public Health in July of 1937.¹ The control measures adopted were, in general, based on the rat control methods employed by the U. S. Public Health Service in the eradication of bubonic plague from our western and Gulf Coast cities, and on the most recent Public Health Service publication on rat proofing of buildings.² These control measures consist of rat proofing of buildings, garbage control and clean-up of premises, and rat extermination. Studies previously reported³ showed that the greatest typhus problem in Georgia is in the small towns and villages and, to a lesser extent, in large cities. After 2 years' operation of the typhus control program, certain modifications in the application of control measures have been made in an effort toward making the control program more effective.

RAT PROOFING

Rat proofing, the permanent typhus control measure, is effectively applied

to individual buildings. It consists of preventing the ingress of rats into buildings, and the elimination or protection of all enclosures within buildings that may provide hiding and nesting places for rats.

The procedure first followed in Georgia was to make surveys of individual business establishments to ascertain the existence, character, and location of rat harborages, and the extent of rat infestation. Written reports, based on these surveys and outlining in detail existing conditions and needed corrections, were prepared and submitted to the owner or tenant of the business establishment.

The cost of rat proofing an entire business establishment, although small in many instances, would be prohibitive in others, especially in old buildings in small towns and villages. Hence, the speed at which rat proofing could be accomplished was not very great. Other factors affecting the program were the need for close technical supervision and the fact that officials of the average city, town, or village were reluctant to participate financially or to enforce regulations because of the high cost of the work involved. It therefore became obvious that rat proofing buildings, on a state-wide basis, was a long-term program requiring many years' work before any appreciable results, as measured by a reduction in the incidence of typhus fever cases, could be obtained.

* Read before the Engineering Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

Many buildings were partially rat proofed, with only a small percentage of building owners complying fully with all the recommendations in the reports made to them. In those buildings partially rat proofed, it was observed that the merchants experienced a great reduction in rat infestation, and in many instances, a complete elimination of rats took place. In general, the average merchant cooperating in the rat proofing program did so voluntarily, and he was reluctant to go to any additional expense for rat proofing his entire building if partial compliance gave him a marked reduction in rat infestation.

In view of these experiences, the need was felt for some modification of our rat proofing program, one that would be relatively inexpensive but still effective, that could be applied in a comparatively short length of time to all business establishments in a city, and that would be practical for municipal

governments to participate in financially and through the enforcement of regulations. A program of vent stoppage was therefore designed^{1, 4} to meet these requirements.

VENT STOPPAGE

Vent stoppage, as the name implies, is the closing or protection of openings in the exterior walls of buildings to prevent the ingress of rats (Figure 1). Basically it is a part of rat proofing, but must be applied to all adjoining buildings, in a given area, in order to obtain the most effective results. In municipalities, the principal rat harbors are buildings which have unprotected openings in the exterior walls, such as those for ventilation, pipes and cables, and those due to deteriorated walls and around doors and windows that do not fit snugly. Openings of this nature serve as active points of entry into buildings, and are the main



FIGURE 1.—Vent Stoppage—Rear of Business Establishment Protected Against the Ingress of Rats

lines of travel for rats between food supplies in adjoining buildings and alleyways and their harborage inside. Vent stoppage therefore serves as the first line of defense against rat invasion of buildings. It was first applied in the City of Camilla, Ga., in May, 1939.

Vent stoppage is accomplished by first making surveys of all business establishments in a municipality. The surveys are based on actual conditions found for each business establishment, and special forms are used to record the information secured (Figure 2). This is necessary to determine the materials needed and the cost thereof for each establishment in order that correct estimates may be submitted to city officials. The surveys are based on actual conditions found at each establishment and

special forms are used to record the information secured. To permit a rapid estimate of the amount of metal flashing needed to protect a wooden door, door jambs and sill, the following empirical formula is used:

$$N (0.1 W \div 1) \div 2 = \text{sq. ft. metal required}$$

Where N = No. of sections in door
W = Width of section in inches

To protect the edges of doors against rat gnawings, 24 gauge galvanized sheet steel is used and installed in the manner as shown in Figure 3. To facilitate the bending of metal for door flashing, we have found that inexpensive brakes, as shown in Figure 3, can be easily made. The wooden type brake costs approximately \$5.00,

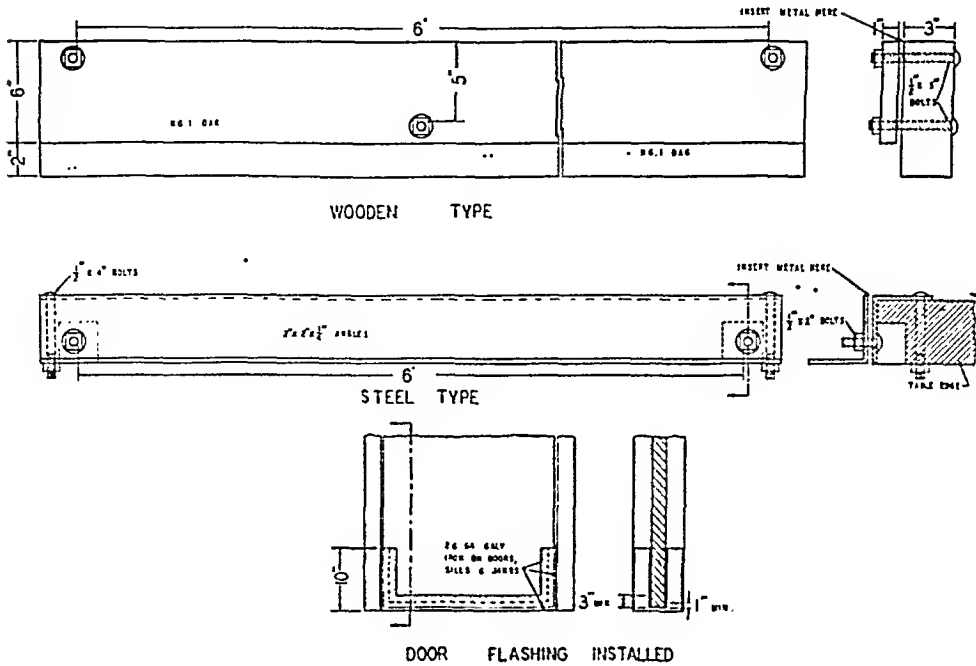
FIGURE 2
'TYPHUS FEVER CONTROL.

VENT STOPPAGE SURVEY
CITY OF MACON, GEORGIA

SHEET NO. 6
BLOCK NO. J
DATE 4-24-40

			Doors				Ventilators			Windows							
			Sections														
Unit No.	Business Name	Type	No.	Width In.	Metal Sq. Ft.	No.	Size of Opening Sq. Ft.	Vent Required Sq. Ft.	No.	Width In.	Ht. In.	Metal Sq. Ft.	Alkce. Cloth Sq. Ft.	No.	Brick	Misc.	
36.	CLIFF WALKER MOTORCYCLE CO.	Auto															
	Front		1	36	6.6	1	21 x 21	4.0									
	Side		1	48	13.6	3	15 x 42	12.0	2	46	—	17.2					
									2	50	104		75.0			25 bd. ft. lumber	
	Rear																
	Comment: Install																
37.	BIG STAR STORE	Food															
	Side		4	19 x 48	28.0												
	Rear		3	10 x 44	11.0												
			3	14 x 48	14.0												
	Comment: All goods and equipment in basement should be stored on open racks 18" above floor.																
38.	BARBER SHOP	—	1	36	6.6				5	48	—	4.8	(use 1" x 1" metal angle)				
39.	MACON FEED STORE	Food															
	Front																
	Rear		1	40	4.0	(no metal required on concrete sill)	1	10 x 48	4.0	3	44	44		41.0			
40.	PEACH STATE HATCHERY	Food															
	Front																
	Rear		1	30	10.0												
			2	36	18.4	(Reset this door to fit within 3/8 in. of sill and jambs)											

FIGURE 3—Inexpensive Types of Metal Bending Brakes Used Principally for Door Flashing in Vent Stoppage



whereas the steel type costs approximately \$6.00.

Care is exercised in replacing all decayed portions of doors and door facings before flashing, in order to secure permanency of the work. It is important that doors should be installed in open stairways and kept closed at night to prevent the entrance of rats. Flashing front doors on a busy street is usually unnecessary, because when such doors are installed so as to fit snugly, rats have rarely been found to gnaw through them.

Ventilator openings in foundation walls are often main points of entry into buildings for rats. In the majority of buildings that we have inspected and found to be rat infested, ventilator openings were found in which metal grills were either removed, broken, or had never been installed. To protect these openings properly, materials are used that will be lasting in quality, such as perforated galvanized sheet steel of 14 gauge, or heavier (galvanized after

perforating), expanded metal of 18 gauge, or heavier, or cast iron grills. Perforations or openings in the grill are never larger than $\frac{1}{2}$ in., thus insuring protection against the entry of rats and still allowing ample circulation of air through them. Many old buildings contain over-size ventilators and abandoned windows in the foundation walls. These are partially closed with masonry, and in the remaining opening metal grills are installed, thereby giving ample ventilation to the building, with an appreciable saving in the cost of materials.

To protect windows, especially those which are close to the ground, against rat entry and at the same time not reduce appreciably the amount of light passing through them, 16 gauge galvanized wire cloth of $\frac{1}{2}$ in. mesh is used. The wire cloth is installed for the entire height and width of the window.

Miscellaneous openings, like those through which pipes, cables, and drains pass, and those caused by the deterior-



FIGURE 4—Vent Stoppage—Galvanized Metal Curtain Wall Installed by J. C. Pittman, Sanitarian, Ware County Health Department

ration of walls are sealed with brick, cement, metal, or concrete. Great care is exercised in properly sealing or protecting abandoned sewers and drains leading into buildings.

In the case of buildings of wood frame construction in small towns and villages, vent stoppage is usually more expensive than for buildings constructed with masonry walls. The reason for this is that the space underneath the floor must be closed with a curtain wall of galvanized metal or masonry extending 24 in. below the surface of the ground (Figure 4), or the building must be elevated at least 18 in. above the ground surface. All other openings are closed or protected in a manner similar to that for buildings having masonry or concrete walls.

Vent stoppage is applied to buildings

under construction by extending the foundation walls to a depth of not less than 24 in. below the outside ground surface. Openings such as doors, ventilators, and those for soil pipes, cables, and the like, are protected in the same manner as for existing structures.

The three methods that are currently employed for financing vent stoppage programs are listed below in the order of their effectiveness and desirability:

1. Municipalities furnishing all labor and materials
2. Municipalities furnishing labor and individual merchants furnishing materials
3. Individual merchants furnishing all labor and materials

The first method insures uniformity in workmanship and the completion of all required work in the shortest period of time. The use of the second method,

although insuring uniform workmanship, delays the completion of the program due to the fact that necessary materials, for individual business establishments, are not always available when needed. The third and least desirable method often fails to provide both the proper materials and the uniformity in workmanship, and consequently entails a long delay in the completion of the program.

Suitable ordinances have been enacted by municipalities in Georgia as a means of aiding the completion and maintenance of vent stoppage programs, as well as to provide for vent stoppage of proposed new buildings.

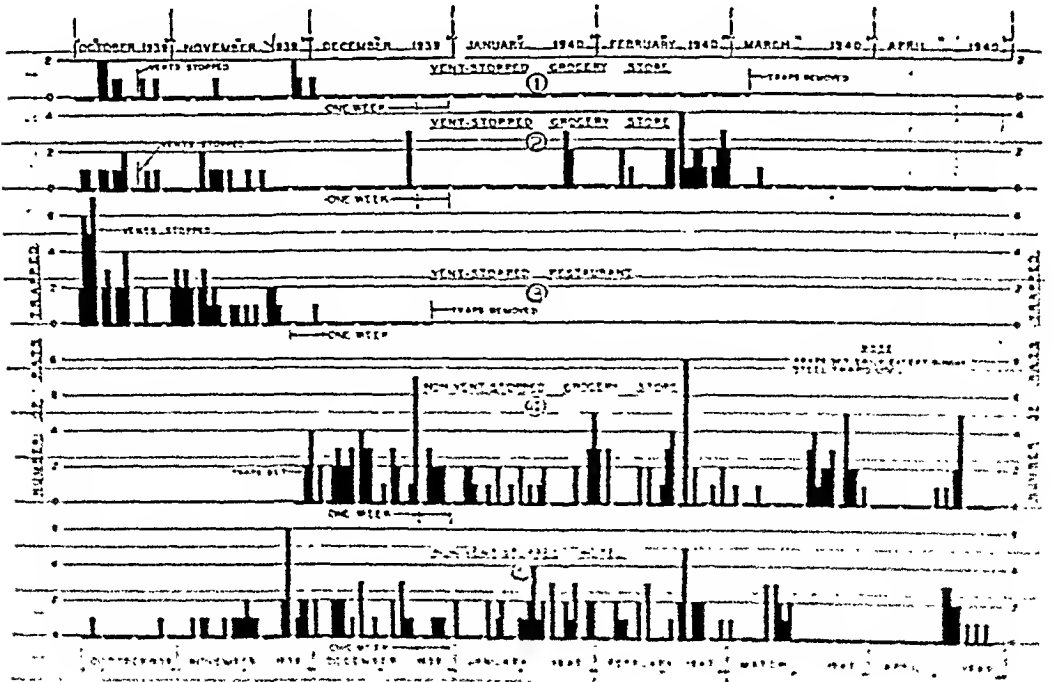
Since the beginning of the vent stoppage program, 19 cities and towns ranging in population from about 900 to 16,000 have coöperated in it, and work on 1,107 business establishments has been completed. The average cost of materials based on these figures was approximately \$3.00 per business establishment, and the average man-hours of labor required for each was 9.5.

In Sylvester, Ga., a vent stoppage

program was started in October, 1939. Sixty-two business establishments comprising the entire business district of the city were vent stopped with the result that, at the present time, approximately 93 per cent of these buildings are comparatively free from rats. Trapping of the rats blocked within those establishments was carried on immediately following the completion of the vent stoppage program. This was done not only to clear the buildings of rats, but also to determine the effectiveness of vent stoppage.

Figure 5 shows rat trapping results in four food handling establishments selected as representative of such types of establishments in the business district of Sylvester. In Figure 5, graphs one, two, and three of vent-stopped establishments show the absence of rat life after the passage of about 6 weeks following the completion of vent stoppage. They also indicate a variation in the degree of rat infestation. Graph number two also shows that rats invaded that establishment on or about

FIGURE 5—Rat Trapping Results in Vent Stopped and Non-Vent Stopped Establishments



December 22 and again on January 25. This was, in all probability, due to a rear door being kept open all day and until late at night, for after the installation of protected swinging doors, followed by more trapping, the evidence of rat infestation again disappeared. Graphs four and five of non-vent-stopped establishments show the continued presence of rat life over a trapping period of 6½ months.

It is realized that vent stoppage, like rat proofing, does not insure against the invasion of rats by accidental means. However, if vent stoppage is properly maintained, business establishments may be kept free of rats by occasional trapping.

Vent stoppage as a rat and typhus control measure has met with favorable reactions from many of our cities and towns in this state. The work has been viewed by municipal officials for the effectiveness of the program, and, as a result, 20 additional cities and towns, including some of our largest cities, have made official requests for assistance in starting similar programs.

GARBAGE CONTROL AND CLEAN-UP

This part of the typhus control program, which is of secondary importance to vent stoppage, is essential in reducing the general rat infestation of a community to a minimum and in maintaining it there. Garbage control and clean-up is carried on continuously as a community-wide activity.

The effectiveness of this control measure is attained through the elimination of the source of food supply for rats, chiefly exposed garbage, and the elimination of harborage that is created principally by outbuildings, rubbish, discarded lumber, equipment, boxes, piles of brick that are found on premises, and especially in basements of buildings and residences.

It has been our experience in this part of the program that the best

results are obtained by informing municipal officials of the conditions that exist and by giving them the recommendations necessary for the correction of those conditions. Supplementing this action, intensified educational programs are carried on through the media of the press, radio, and personal and group conferences.

As a result of this part of the typhus control program, many cities and towns have increased the efficiency of their inspection services and of their garbage collection system by adding personnel and equipment. In addition, they have improved the enforcement of existing garbage regulations and the method of final disposal. They have become sufficiently interested in proper garbage control and general clean-up to realize that it must necessarily be made a permanent municipal service on a par with other routine activities. It has also been observed that a marked reduction in the general rat population has followed this work in those towns carrying on this part of the program.

EXTERMINATION

Rat extermination, employing the use of red squill poisoned bait, has been carried on in 23 cities and towns only as a temporary means of typhus fever control. In order to obtain full effectiveness it must be done periodically at short intervals until such time as permanent control measures can be started. Poisoning campaigns are very expensive for the temporary results obtained. This fact makes it difficult to induce municipalities to finance and operate such programs over a long period of time. However, when emergencies are created by outbreaks of typhus fever, rat poisoning campaigns are applied to areas of communities predetermined to be foci of the infection.

Since the adoption of vent stoppage as the permanent typhus control measure, another method of extermination—

trapping—has become increasingly important. Vent stoppage, if properly carried out, will obviously block a large part of the rat population of any business area inside the buildings, and it is often found necessary to employ some form of extermination in these buildings due to the complaint of merchants of the increased activity of rats. Especially is this the case with food handling establishments. Trapping is the most desirable means of accomplishing this purpose. It is relatively inexpensive as well as efficient in that usually only a very short period of time is required to eliminate all the rats blocked within a building. It also provides a means of removing rats from buildings each day, thereby eliminating any complaints from merchants because of obnoxious odors resulting from decaying rat carcasses. In addition, trapping serves as an excellent means of securing data for investigative purposes.

CONCLUSION

The murine typhus control measures as presented in this discussion are, we believe, in part responsible for the reduction of the incidence of this disease, which has occurred during the past year in cities and towns in which this program has been applied.

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NOTE: The author acknowledges with appreciation the assistance rendered by his associates, L. W. Murphy, Jr., and Joel C. Beall, Assistant Typhus Control Engineers. Acknowledgment is also made to Roy F. Dunn, Public Health Engineer, Worth County, Ga., Department of Health, for his cooperation in furnishing investigative data.

Educational Qualifications of Industrial Hygienists*

IN Preliminary Survey of the Industrial Hygiene Problem in the United States (*Public Health Bulletin No. 259*), it is estimated that there are in this country approximately 50,000,000 gainfully employed persons exclusive of familial dependents whose health status is not only dependent upon the protective and educative services normally established as a part of a whole-time community health service, but who require particular attention because of their occupation and its relation to their health and welfare. While in past years the greatest conservations in human life have been made in the earlier age groups, there remains an astounding need for dealing with chronic diseases and the specific hazards which affect the industrial population.

The survey made by the U. S. Public Health Service in 15 states involving 16,803 plants and 1,487,224 workers offers a sampling of the health status of 3 per cent of the workers in the United States. From this sampling is obtained a general view of the specific exposures potentially inimical to health to which our industrial population is subjected. Approximately 2,750,000 workers are exposed to organic dusts; there are 2,250,000 workers exposed to

"other metals"; more than 1,000,000 each are subjected to the hazards of carbon monoxide, petroleum products, silicate dust, dermatitis products, miscellaneous gases, and silica dust—to mention only a few of the most important hazards.

Since it is impossible and undesirable to create a definite cleavage between the general health problems of a community and those which pertain more directly to the industrial field, we feel that no steps should be taken to separate the training of industrial hygienists from the general program of preparing personnel for all phases of health service. Rather should there be created means to emphasize in addition to such fundamental training, special courses to acquaint the industrial physician, nurse, engineer, chemist, and health educator with this particular field. Thus, the physician who serves as plant health officer, who specializes in industrial toxicology, who directs the activities of an industrial hygiene bureau at federal, state, or local level; the public health nurse who becomes a member of the staff of the industrial medical service or who participates as consultant or specialist in industrial public health nursing and education; the public health engineer who is concerned with problems of environmental health; should all receive their basic training in their fundamental public health avocations. To such basic training should be added instruction in the special field of industrial medicine, hygiene, and sanitation.

* Preliminary Report of the Subcommittee on Educational Qualifications of Industrial Hygienists.

The Committee on Professional Education publishes this preliminary report to permit the members and Fellows of the Association to review it and to offer criticisms and suggestions in the further consideration of the report. This report, like all other statements of the Committee on professional and technical qualifications in public health, after approval by the Governing Council, is subject to periodic revision in order that it may be kept abreast of the best thought.

While it is true that the defense program tends to emphasize the urgent need for protecting the health of the industrial worker, we do not believe that this need is of any temporary character as the normal health problems encountered in industry demand that more emphasis be directed toward this field. Granting that an emergency may encourage many physicians, engineers, and nurses to direct their attention to and thus concern themselves with specialized training for industrial hygiene, possessing the basic and fundamental training and experience in the broad field of public health, these individuals will be readily absorbed in the extension of full-time state and local health service. Such local service now reaches only about one-third of the counties of the United States and is subject to material expansion in our states and urban areas.

A survey reported under date of March 1, 1941, by the Committee on Medical Preparedness, with the cooperation of the Council on Industrial Health of the American Medical Association, indicates that there are 4,981 physicians now engaged or who have had experience in industrial practice (the survey is not complete, only 6,332 replies having been received for 10,134 schedules mailed to physicians). A preliminary tabulation indicates that the majority of these physicians are engaged in general industrial practice, less than 1,000 on a full-time basis and more than 2,000 on a part-time basis. Of 4,434 schedules studied, but 24 physicians are engaged in occupational disease control work and only 8 of these on a full-time basis; 139 are concerned with plant medical department administration, 103 of these on a full-time basis.

The U. S. Public Health Service reports that of 23,705 public health nurses in the United States, 3,271 were listed as industrial nurses. Of this latter number 75 per cent had completed high

school before entering a nursing school but only 3.9 per cent (40 individuals) had received one or more years of public health training.

As of mid-year 1940 there were in the state and local health departments 37 trained medical industrial hygienists, 81 engineers, and 37 chemists. At the same time there were employed by the U. S. Public Health Service 51 trained industrial hygienists, of whom 15 were physicians.

The above figures indicate not only the scope of the problem to be met and the specific nature of the potential health hazards, but how small is the personnel now available and how meagerly trained at academic level is such personnel.

The industrial hygienist should have fundamental training in the sciences and the humanities. The industrial physician should have a preliminary training similar to that of the health officer, and after his graduation in medicine should have supplemental training and field experience not unlike that of the health officer, with, however, major emphasis in the field of industrial hygiene and environmental health. Likewise the industrial public health nurse and the public health engineer who specialize in the industrial field should possess the basic training and experience common to other public health nurses and public health engineers, to which should be added specialized emphasis in the field of industrial service.

The committee does not feel that at this time it is desirable to suggest an inflexible curriculum or even a basic outline of a course in industrial health. In general, however, it may be said that in addition to his medical training and experience the industrial physician should have a good knowledge of community health problems; of epidemiology with special reference to the control of communicable and occupational

diseases; basic training in physiologic hygiene with special emphasis upon adult health, nutrition, and mental hygiene. He should also have a good knowledge of the engineering expressions to the physiologic problems of environmental health; should be acquainted with the technics and services of public health practice including health education, industrial relations, economic responsibilities, and public health law. He should be trained so as to serve effectively in directing rehabilitation services for handicapped individuals; should be acquainted with the technics of accident prevention and safety; and should be especially prepared to secure and maintain friendly and adequate relationships with welfare agencies, physicians, and dentists engaged in private practice.

The industrial public health nurse should have a broad training which encompasses the same general field as described for the physician, but with of course major emphasis in those services which fall within the purview and qualifications of a nurse. She should be prepared to serve as an assistant to the physician in clinic service; should have the ability to understand the social and economic needs of the employees in relation to the problems of the employer; and should take such courses as will prepare her to do a good job in the field of health education.

The public health engineer in industry should in his training and experience be exposed to the general problems encountered by the industrial physician but with additional technical training in

the field of engineering, in the control of working environment with special emphasis upon the sanitation of working places, illumination, ventilation and air conditioning, and the control of industrial exposures. Likewise the chemist should have fundamental training in chemistry and public health work with added special emphasis upon industrial toxicology.

In conclusion, may we repeat that we do not feel that the industrial hygienist should be trained apart from the other groups which have chosen public health service as a life career. The industrial hygienist should be a part of the health personnel trained and experienced to deal with the broad problems of community health service. One cannot begin too soon in such training processes. It should be begun in our schools of medicine and engineering, carried forward at graduate level concurrently with field experience, and may endure by the creation of refresher or postgraduate courses which will keep the personnel attuned to the newer technical services and abreast with the field of public health as a whole.

SUBCOMMITTEE ON THE EDUCATIONAL QUALIFICATIONS OF INDUSTRIAL HYGIENISTS:

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The A.P.H.A. Membership Nomination Blank

On page XXI of this issue of the *Journal* appears a form to be used by members of the A.P.H.A. in nominating other persons for membership. This blank will be carried in the next few issues and we hope that every member will use it at least once.

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ACTIVE IMMUNITY TO TETANUS

IT seems likely that public health practice, in relation to the use of tetanus toxoid, is not quite abreast of the time. The possibilities of effective use of this material in the production of active immunity to tetanus has gone well beyond the research stage, and yet its application is quite limited and spotty in this country. Although the number of deaths reported from tetanus in the United States Registration Area in 1938 was only 930, the amount of tetanus antitoxin used annually is evidence that there are hundreds of thousands of wounds where the possibility of tetanus must at least be considered. This being so, and in view of certain limitations in the circumstances in which tetanus antitoxin may be used for the rapid creation of a passive immunity, it would seem that those in public health work would find tetanus toxoid a valuable addition to their armamentarium for preventive medicine.

In the course of research and field trials, it has been found that tetanus toxoid may be combined with either diphtheria toxoid or typhoid vaccine and injected together. This may be done without detriment to the antigenic properties of either substance. Some investigators maintain that the effectiveness of each is actually increased by injection of such mixtures. In any event, one does not need to institute tetanus vaccination as a separate series of injections, and pediatricians, in one place or another, are taking advantage of this fact. The dose is one cubic centimeter, the number of doses from two to three, the time interval from one to six months. As a measure of increased safety, it is advisable to give a stimulating dose of tetanus toxoid if and when the individual is wounded. Reactions are absent or mild. The length of time that a high titer of antibodies remains in the serum varies, but evidence points to the fact that even after some years, one dose of toxoid will in a matter of days bring immunity to an effective level.

From the evidence at hand the use of tetanus toxoid would appear to be a valuable procedure in the armed forces. The French Army introduced it some years ago, and there have been statements that it is a practice in the Italian and Russian Armies. In the English Army it is said to be voluntary, but utilized in a high proportion of troops. The Canadian Army injects tetanus toxoid with

typhoid vaccine. In civil life there are many groups where it would seem to be indicated: farmers and their families, industrial workers, children in general who have a proclivity for sticking nails into their feet, and others who for one reason or another may run a chance of infection with *Clostridium tetani*.

Many articles on this subject have appeared in various journals in the past few years. An excellent review by E. P. Jordan and George Halperin will be found in Volume I, No. 2, of *War Medicine*: the March, 1941, issue. This, in particular, we recommend for orientation in the subject.

RECRUITING PUBLIC HEALTH PERSONNEL

WE have heard recently a number of speeches on public health and national defense, and all of them were poor. We have made a few, too, and these were even worse. It is not an easy subject to discuss, for if one is not careful there is a lack of realism, and platitudes and clichés creep in. Thus, one embarks upon the theme that "public health is the first line of defense," or that "health protection of the civilian population is just as important as that of the military." There is, of course, some truth in these statements, but that "first line of defense" concept necessitates a tricky two-way definition of the word defense; and, while it is obviously a military necessity to maintain the health and continuing production of workers engaged in war industries, it must be confessed that an epidemic of influenza producing disabilities in a city would not be nearly so detrimental in time of war as it would if it caused a similar proportion of noneffectives in a tank corps or in a battleship. This is not to depreciate the importance of civilian health, but rather to emphasize to public health workers that the needs of the military, in personnel as well as in equipment, must come first. The United States of America is not just playing at war games; the boys in camp are not just tin soldiers; and student pilots in aviation are not playboys. This is the real thing, and it would seem that the sooner we in public health work and, incidentally, others, stop labeling everything "national defense," the better. There is only one first line of defense and that is the armed forces. Other things are of course important, even essential, but they must be secondary to meeting the immediate and continuing needs of those who are to repel and defeat an enemy.

All of this is preliminary to discussing the problem of recruiting public health personnel in the circumstances which exist. Common sense indicates that in this connection public health administrators might just as well make up their minds to an adjustment. We can use persons with minor physical disabilities, the Army and Navy Medical Corps cannot. If an individual possesses the necessary basic professional training and a reasonably good mind, it does not greatly matter to us, temporarily, that he has a fixed or movable bridge or a full set of false teeth, as long as he doesn't click them at people. A mild kyphosis, a squint, or somewhat flat feet need not necessarily make one unfit for certain phases of public health work, and a sanitary engineer of forty or a doctor even of fifty could be of some use. Women physicians, heretofore utilized only in a restricted manner in public health work, might well fill many of the positions previously occupied by men.

It would seem, therefore, that there are still sources from which public health may draw recruits. The only barrier now to be hurdled appears to be a psychological one. Public health administrators have, as a habit, looked to the robust and fairly recent graduates in medicine, engineering, nursing, etc., as the group from which new appointees would come. Because this stream is now diverted,

many state and city health officers seem inclined to throw up their hands and say there is nobody left to employ. Probably they will get over this as the pressure of staff vacancies becomes more acute, and will turn to these other sources. If this is so, might it not be wiser to meet the situation by carefully revised plans than to have these vacancies filled, and filled they will be, in a sort of hit or miss manner? The latter method would inevitably draw less desirable personnel than would be the case if foresight is exercised.

This new personnel is, and increasingly will be, badly needed, for even though one must be realistic and admit prior claims of the military, this does not lessen the necessity for maintenance of the health of the civilian population. But in shifting the search for recruits to a field not in competition with the Medical Corps of the Army and Navy, we must recognize a real danger that standards of competence may be lowered. Not only that, but there is the problem of civil service qualifications. Some state and city health departments have spent years in getting civil service standards up to a high and commendable level. Others are just embarking on civil service ventures. Every effort must be made to conserve old progress and insure new gains in personnel requirements as they relate to the public health field. It would be extremely unfortunate if in attempting to meet present problems by adjusting requirements to age and physical condition, we should unwisely make concessions as to professional competence, for the latter, in the long run, would be detrimental. How public health administrators may best safeguard against this will vary in the individual states and cities. In some places the civil service commission might, in view of the national emergency, lengthen the probationary period or extend the length of time of temporary appointments. In any event, in recruiting new public health personnel, two things must be borne in mind. The first is that the regular sources of recruitment are no longer open, and, second, there is danger of lowered standards.

How to orient, train, or educate new appointees follows naturally on the problem of recruitment. But that is another story.

HEALTH ORGANIZATIONS AND THE TELEPHONE

ONE could not conduct a modern business, a practice of medicine, or a public health program without a telephone. Upon that much all will agree. But comparatively few of those who use this method of communication recognize that it has its drawbacks and possesses dangers of doing subtle damage, only belatedly recognizable as such. These potential liabilities are not an inherent part of the telephone itself, but arise rather because of the circumstances in which the telephone is utilized and as a result of the effect it has upon those who make and receive calls. Most of these disadvantages may be offset by a little forethought, and it therefore seems worth while to review them as they relate to health organizations.

The first circumstance entering into the situation is that talking to an unknown at a distance has a peculiar psychological effect upon some people. Thus Mr. Bigg, in making or receiving a call to or from a stranger, cannot visualize, as a personality, Mr. Waite who is on the other end of the wire. Now any inclination that Mr. Bigg has to be perfunctory, or sour, or pompous, or a bully, is likely to come into full flower, for his personality for the time being has no opposition. Until his auditory apparatus and receptive centers register the implications of the name, position, and voice of Mr. Waite, Bigg is in his own

mind completely master of the situation; and possessing any of the characteristics just mentioned is likely to treat Waite as a nonentity. This, of course, does not please the latter, who is perhaps going through the same mental processes. The outcome of the conversation in such circumstances is unsatisfactory. Most people who occupy responsible positions have learned to curb these undesirable personality traits, but health agencies must remember that in most incoming calls, and in too many outgoing ones, it is the voice of a subordinate which represents the organization.

A second thing which has entered into telephone usage is having one's secretary make the call. The secretary, quite aware of who pays her salary, wants to please her employer. She therefore gets Mr. Waite on the telephone and then tells him that Mr. Bigg wants to speak with him. Mr. Bigg by this time may be on another telephone, or getting a drink of water or something. Mr. Waite for his part has to hold everything until Mr. Bigg comes to the 'phone. We speak almost bitterly on this matter, because invariably we have occupied the position of Mr. Waite: we have had to wait for Mr. Bigg, which has made us fume and wonder who the devil Bigg thinks he is. Naturally, it would be all right for the President of the United States to have most anyone wait for him to come to the telephone. It would be quite proper, too, for an executive to have his own subordinates do the same, but it would be unwise, to say the least, for a health officer, via his secretary, to telephone to the Mayor and keep His Honor waiting. It would seem that the least Mr. Bigg can do is to be ready to speak to Mr. Waite when the latter is put on the 'phone. Common courtesy indicates this in all affairs. In health organizations, common sense and tact demand it, unless, of course, Bigg wishes to emphasize to Waite that he considers him a person of no importance.

Many health organizations, in an effort to be businesslike and efficient, have eliminated "hello" on answering the telephone, which probably is wise. Usually on raising the receiver the name of the organization is given, say as "Western Health District." Now, when one considers the possible permutations and combinations of pronunciation, enunciation, rhythm, inflection, word emphasis, and tonal qualities, to say nothing of variations in speed and loudness of voice, it is apparent that the salutation "Western Health District" may carry to the listener anything from cordiality to insult. What it usually conveys is an impression of boredom and perfunctoriness. The person who first answers the telephone in a health organization does, therefore, occupy a position of importance, a sort of public relations ambassador without portfolio, and should be selected with this in mind and trained to become an asset.

This telephone business may seem a small thing in its relation to public health, and we wonder if we are justified in using editorial space for it. But here it is, for what it is worth.

Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

IN THE OFFING

A preview of the program for the Eighth Institute on Public Health Education causes us to look forward to October 12, 13, and 14 with unbounded interest. Those are the days on which the Institute will be in progress in Atlantic City, N. J., and we believe that you should turn to your desk calendar now and mark those dates as follows: "Away from office for Health Education Institute." The program abounds with items of varied interest, and no health worker could spend three days of his time more profitably than in attendance at this Institute where health education will be discussed, appraised, evaluated, and criticised by a veritable "who's who" of the profession, aided and abetted by the "up and coming" who are always given a voice in the discussion or clinic proceedings.

As in previous years, the Institute program will be highlighted with speakers who can be counted upon to give the audience something new and stimulating and practical. Dr. Ira V. Hiscock and his Institute Committee are to be congratulated on this year's Institute fare which will certainly whet the appetite of every health educator when the program is released.

We note that exhibits are to receive considerable attention at the forthcom-

ing Institute. This phase of the program should be unusually profitable, for there is no medium of health education that needs searching analysis so much as the exhibit. With such authorities as Gebhard, Calver, Kleinschmidt, and Schmuck leading the exhibit discussions, much progress should be made toward clarifying the entire exhibit issue.

Everyone in public health will find items of interest on the program. We hope you will be among those present when the curtain goes up on the Eighth Institute on Public Health Education, Atlantic City, N. J., October 12, 13, and 14.

FORTUNE LOOKS AT THE U.S.P.H.S.

A well deserved tribute was paid the U. S. Public Health Service and its staff in the May, 1941, issue of *Fortune Magazine*. Two separate articles appeared in the publication—one on the history, activities, and the aims of the nation's great health agency, and another on the life story of one of the Service's "career men," a typical health officer. The appearance of these articles marks one of the few times that *Fortune* has devoted space to subjects of this nature. These articles on the Public Health Service will reach an influential audience, as *Fortune* is a magazine with a wide circulation among leading business executives. We congratulate *Fortune* on bringing this intimate view of the U.S.P.H.S. at work to a group of

Please address samples of printed matter, correspondence, or other editorial material to the editors at One Madison Avenue, New York, N. Y.

readers that perhaps has had little opportunity to become acquainted with one of the nation's most vital services.

The *Fortune* articles state that the entire force of the Public Health Service is performing what is probably "the most heroic job in the United States today." Moreover, the article adds, the task is being done by men and women whose pay is far from glamorous, though regular. Workers in the Service take their monetary rewards philosophically — "One needs money for food, for shelter, and for health; beyond that happiness comes from life itself."

The magazine stresses the fact that public health is the nation's No. 1 national resource—the motive power of everything: farming, industry, the army.

Increased realization of what health means to the nation has been brought about by our defense needs, according to *Fortune*. The magazine points out that: "Now for the first time we are beginning to see in health something positive, a resource to be developed to the last full measure. In the dim past the health precept was: eliminate the sick; then it became: cure the sick; then: don't get sick; and now it is: be healthier. This last is precisely what the U.S.P.H.S. means when it preaches that health is part of life, liberty, and the pursuit of happiness."

The *Fortune* article dealing with the career of a health officer creates a very definite impression in the mind of the reader—namely, that our country has no more loyal and devoted public servants than its health officers. It is inspiring to read of the work that the health officer accomplishes despite the ignorance, fear, and negligence that he encounters in many places where his work takes him. All of which brings to mind the fact that as yet there has been no popular book on the health officer. The public has had a plentitude of books telling the interesting life

stories of physicians, surgeons, lawyers, ministers, and editors; but the health officer remains unsung. We hope some writer will soon tap this rich source of story material. Until a book on the health officer comes along, read the *Fortune* articles. They come as near as anything we know to giving a true appraisal of the services rendered by the country's health workers.

PUBLICATIONS AND POSTERS

Health educators, teachers, school administrators, parents, and others who are largely responsible for children's mental health will find a valuable and authoritative guide in a publication issued by the American Medical Association under the title, "Mental Hygiene in the Classroom." The excellent material in this publication stems from a report of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, with the cooperation of the National Committee for Mental Hygiene and the American Orthopsychiatric Association. Situations derived from case histories are presented and the reader is asked to select from three possible procedures the best method for dealing with the problems involved. These case studies make clear to the reader the application of mental hygiene principles to ordinary situations which teachers are likely to face every day in their classrooms. In the discussion of these situations, the booklet frequently recommends a good physical examination as a starting point for the solution of the child's difficulties. Daily health habits in relation to behavior problems are also considered throughout the publication. Furthermore, the booklet recognizes that the development of good mental health habits is far more important in the education of children than the acquisitions of skills such as reading, writing, and arithmetic. Also reported in this publication is the fact

that many schools are dropping the old system of marking, as they believe education should be planned to fit the capabilities and needs of children. This helpful and well organized publication may be obtained, at 20 cents per copy, from the Bureau of Health and Public Instruction, American Medical Association, 535 North Dearborn Street, Chicago, Ill.

Two new publications and two new posters on syphilis have recently been made available. One of the publications entitled "The Doctor Says . . ." comes from the U. S. Public Health Service and relates in an informal conversational style the information that a physician might give to a young couple seeking blood tests. It is a convincing presentation and could be used to dispel opposition that health officers might encounter in localities where pre-marital blood tests have been questioned by those unfamiliar with or misinformed regarding the purpose of the procedure.

"How Many People Have Syphilis?" is the title of a reprint that the American Social Hygiene Association is distributing in an effort to clarify the question of the prevalence of this disease. Widely differing estimates have been given as to how many people have syphilis, and a brief and authoritative report on the subject has long been needed. This reprint, which health officials should call to the attention of newspapers and other publicity media, is available from the association.

Those who have been calling for health posters executed according to modernistic technics will perhaps find all that they have wished for in two posters on syphilis which the U. S. Public Health Service recently produced. The blood tests for syphilis and congenital syphilis are the subjects which the new posters publicize. Both are striking examples of modern poster

art in which unusual layouts and effective color combinations are utilized. While we favor discarding all moss-backed technics in health education materials, we do feel that the blood test poster may be a bit too modernistic, too "arty," too Grecian in its conception for the audience which it endeavors to reach. Let's make use of every new idea or technic possible in posters and other publicity media, but at the same time let us not lose sight of the fact that the greater part of the audience which will see these posters is not yet "educated" to modern art conceptions and consequently the more conventional type of illustration may be more effective in putting over a message. The slogan on the blood test poster—"Know for Sure—Get a Blood Test for Syphilis"—meets all the requirements of a good slogan: it is brief, explicit, to the point, and easily remembered. The Public Health Service has done an outstanding job in the preparation of its educational materials on syphilis and gonorrhea.

MORE ABOUT REPORTS

Since the first of the year every issue of "Credit Lines" has contained references to the yearly reports of health agencies. If you are becoming somewhat allergic to reading comments on the subject, we can hardly blame you. Nevertheless, as long as outstanding examples of annual reports reach us we feel that they should be given due recognition in this section of the JOURNAL.

Regardless of the wordage that has been devoted to the subject to date, space would have to be found for comments on such a report as that of the Westchester County Health Department, White Plains, N. Y. "Forward to Health" is the appropriate title of this report which recounts the work of the department from 1930 to 1940. It is a handsome publication, spirally bound, and profusely illustrated with

photographs, line drawings, and pictorial charts. The typography, the layout of the pages, and the excellence of the art work all contribute to make this report an "optically pleasing publication," as *Time Magazine* might say. The 71 pages of this report present a vivid picture of the work accomplished by the Westchester County Health Department and it is, indeed, a record of which the entire staff of the department and the community which it serves can be proud. The foreword to this report, written by Dr. George H. Ramsey, the Health Officer, summarizes in a picturesque way, a concept of public health work which is so effectively expressed that it deserves quoting:

Gentle fingers of a nurse show a new mother how to care for her baby, and another citizen will grow up without the ills that recently were common in childhood. Nimble fingers of a white-clad physician guide the needle that pricks lightly into a boy's arm, and another child has been saved from smallpox. Trained fingers apply their test-tube learning to specimens of milk and of water, and disease is tracked down before it can do its harm. Busy fingers play a symphony on typewriters and coding machines, and the ailments of a county's residents are recorded in a central office to steer public health workers in the fight against disease.

This is the work of public health, an art that organizes the efforts of individuals trained in many specialties into one cohesive program for longer and better lives.

"Forward to Health" is a capably wrought report in all respects and one which we wish every health worker might see—especially those upon whom the job of preparing annual reports falls.

A simple, inexpensive report graced by an attractive title—such is the annual report of the Pasadena Health Department, Pasadena, Calif. "Health Happenings—1940" is the wording that appears on the cover. This seems to us a particularly intriguing and interest arousing title. The report is well written, attractively illustrated, and has a table of contents that is a clever com-

bination of statistical information and page references.

Would you believe that an appealing annual report could be presented on a single folded page of standard letter size? "It can't be done" is probably the answer that most people would give to this question. Yet, the District Nursing Association of Portland, Me., has "turned the trick." And, moreover, room was found in the make-up of this report for an imaginative and original presentation of the nurse's rôle in the community. Three illustrations appear in connection with the text—one showing the head of a nurse, another the nurse's hands, and another the nurse's feet. Accompanying each illustration is the following text: Her head is trained to instruct in matters of health . . . Her hands give skilled nursing service to those ill in their homes . . . Her feet travel 5,000 miles a year to do bedside nursing and give maternity care. This simple report must be seen to be appreciated.

An impressive account of the activities of the Georgia Warm Springs Foundation is revealed in its report for 1940. The Honorable Franklin D. Roosevelt, in the foreword, voices the hope that the Foundation will be able to devote more of its time to the broader aspects of the aftereffects of infantile paralysis for the benefit of all afflicted by the disease. The President also emphasizes the fact that the existence of the Foundation has aroused to an unbelievable extent in this country, and even abroad, a public recognition of the havoc caused by infantile paralysis and the necessity of making every effort to bring it under control.

The National Foundation for Infantile Paralysis, whose work is closely allied with that of the Warm Springs Foundation, is performing many valuable services to medical science and

public health. In the first place, it is effectively coördinating hitherto dissociated research activities having to do not only with infantile paralysis but with virus disease in general. In this respect, it has brought a reasonable degree of order into what was previously a chaotic condition. Furthermore, the Foundation has admirably demonstrated how research funds can be controlled and utilized for the benefit of the people, subjected only to unprejudiced scientific guidance and restraint.

MEAT FOR MILLIONS

Under the above title, the New York State Trichinosis Commission has issued a comprehensive report on the problem of trichinosis in New York State. This report is based on a study that was undertaken by the Commission, of which State Senator Thomas C. Desmond is Chairman. George H. Ramsey, M.D., Commissioner, Westchester County Health Department, Westchester, N. Y., and Professor O. R. McCoy of the School of Medicine and Dentistry of the University of Rochester, Rochester, N. Y., are members. The Commission has recommended that three main lines of attack be used to combat the disease: (1) institute legislature measures to prevent the feeding of uncooked garbage to hogs; (2) establish a state meat inspection service; and (3) investigate the possibility of a trichinosis skin test for hogs.

The report covers in an exhaustive manner all phases of the trichinosis problem, including control measures and prevalence, with recommendations relative to the feeding of hogs, the handling of pork products, meat inspection, and housewife education. The report also includes a section on tularemia.

The United States is said to have the largest trichinosis problem of any nation in the world—more than 21,000,000 Americans being infected. Here, then, is a problem for public health

authorities to attack with all the resources at their command. The report of the New York State Trichinosis Commission should be helpful to health officials in localities where the disease is of major importance.

MAGAZINE ARTICLES

Current popular magazine articles on health or of medical import:

"Good Eyes for Everyone." Mary Halton, M.D. *Parents' Magazine*, March, 1941.

"Turning the Mind Inside Out." Waldemar Kaempffert. *Saturday Evening Post*, May 24, 1941.

"The Surgeon Follows the Bombs." Hannah Lees. *Colliers*, May 24, 1941.

"U. S. Public Health Service." *Fortune Magazine*, May, 1941.

"The Postman Always Looks Twice." N. L. Burnette, Sc.D. *Canadian Home Journal*, May, 1941.

"An Epoch-Making Cure for Gonorrhea." Paul de Kruif. *The Reader's Digest*, June, 1941.

"To Become a Great M.D. Begin at 14." Paul de Kruif. *The Reader's Digest*, June, 1941.

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

JOTTINGS

The efforts of health authorities to introduce modern medical and sanitary procedures in a remote Mexican village where disease and sickness were treated by natives who practised magic and herbology, are recounted in a new book by John Steinbeck entitled "The Forgotten Village" (The Viking Press—\$2.50). This book pictures a dramatic clash between medicine and magic and shows what can be accomplished through health education among people whose manner of living is almost the same as it was a thousand years ago. . . . The National Nutrition Conference recently held in Washington, D. C., out-

lined a campaign of popular nutrition education that will bring into play all types of publicity media: the radio, the motion picture, the exhibit, lectures, publications, posters, etc. It appears that health education will be the spearhead of the campaign to induce Americans to eat their way to health. . . . We recently came across a definition of the word "appropriation" that will doubtless appeal to health officers: Appropriation—a body of money entirely surrounded by curtailment. . . . Health educators interested in improving their copy writing should procure a little book by Henry Justin Smith entitled "It's in the Way It's Written." It is full of sound advice for those who do any kind of publicity. The book may be secured from Louis Mariano, Chicago Daily News Building, 400 West Madison Street, Chicago, Ill., at 30 cents per copy. . . . Health departments contemplating campaigns on infant mortal-

ity or planning to institute a series of health panels for the public should see two monographs on these subjects recently issued by the District Health Education Demonstration, Department of Health, New York, N. Y. These monographs contain all the "ammunition" necessary to the successful conduct of such activities. . . . Did you miss Dr. Norman C. Wetzel's article in the March 22 issue of the *Journal of the American Medical Association* entitled "Physical Fitness in Terms of Physique, Development, and Basal Metabolism with a Guide to Individual Progress from Infancy to Maturity"? It should be placed on your list of useful references. . . . Quotation of the month: "I am a firm believer in the theory that you can do or be anything that you wish in this world, within reason, if you are prepared to make sacrifices, think, and work hard enough and long enough." (*Sir Frederick Banting*)

BOOKS AND REPORTS

Studies in American Demography
—By *Walter F. Willcox*. Ithaca:
Cornell University Press, 1940. 556
pp. Price, \$4.50.

This interesting book summarizes the publications of a man who has labored in the field of vital statistics for about 50 years; one who during most of his career was compelled to work with meager statistical raw material of indifferent quality—not that the quality is always too good today! In some ways, therefore, the book calls to mind the old family doctor, who was shy on modern technical gimcracks, but who did make the most of close observation and common sense.

The first of the three main sections of the book deals with studies in American census statistics. The twelve chapters in this section include such subjects as statistical tests of progress, world population, longevity, development of the American census, and the statistical aspects of population density, sex, race, age, literacy, and marital condition.

The second section deals with American registration statistics, with 7 chapters on the development of registration, birth rates and substitutes for it, standardization, alleged increase of cancer, divorce, and immigration.

The third section devoted to miscellaneous studies touches statistical aids to courts, measuring public opinion, history of statistical societies, and biographical sketches of John Graunt, Lemuel Shattuck, and John S. Billings.

An appendix gives 10 pages of definitions of statistics and demography, a discussion of the population of China, and the author's own bibliography of roughly 120 titles.

Among the more important contributions of the book are the author's own observations of the development of the Bureau of the Census and of the American registration system, with both of which he had long and intimate association. His discussions of under reporting should make wholesome reading for the young statistician.

His use of the fertility index (population under 5 per 1,000 women age 15–44) in place of the birth rate is an example of the ingenious use of substitutes; likewise his use of the ratio of rural to urban mortality as a rough measure of the completeness of death reporting. Rather wistfully, he wishes he could have had longer use of statistics derived from birth registrations, post card and other samples and the other recent developments.

Willcox points out that he is no mathematician. This reviewer recalls not a single formula in the book, and such processes as standardization are explained in detail as text.

Most of the statistics terminate with 1930.

To the student of the history of demography, this book should prove valuable and interesting.

A. W. HEDRICH

Social and Economic Aspects of Swedish Population Movements, 1750–1933 — By *Dorothy Swane Thomas*. New York: Macmillan, 1941. 487 pp. Price, \$6.00.

The chief feature of this study of population movements is the analysis of the source and destination of migrants by type of community. The basis for the classification of communities is the degree of industrialization

and urbanization. Thus communities are ranked beginning with those which are almost wholly agricultural and ending with Stockholm, the metropolis of the nation.

As a background for this study of migration Dr. Thomas has sketched briefly but clearly the development of Sweden's population since 1750 and the chief features of its agricultural and industrial development during this period. She has also shown how the economic and social development of the country is related to the changes in the numbers and the composition of the population. Her brief introductory statement of the importance of knowing the composition of a people in order to understand its social and economic development is excellent.

The study of migration shows, as would be anticipated, that the net movement of migrants is from the more rural areas to the more industrialized and urban areas. But it also shows that this net movement is only a small part of the total movement. This is a feature of migration, and particularly of internal migration, which has not been generally realized, nor has its social significance been much appreciated.

It is to be regretted that the lack of data makes it impossible to pursue similar studies of migration in this country. WARREN S. THOMPSON

Child Care and Training—By Marion L. Faegre and John E. Anderson. (5th ed. rev.) *Minneapolis: University of Minnesota Press, 1940.* 320 pp. Price, \$2.50.

The widespread use of the above book, published originally in 1928, is testimony to its excellence. Now in its fifth edition, it is recommended highly in health, welfare, and educational journals. In each new edition the authors have checked and rechecked the previous edition, bringing the material up to date.

One of the outstanding features of the book is the "preventive" program presented, which is in line with the note of prevention found in progressive medical circles. It has a psychologically sound philosophy presented in a straightforward manner, and is charmingly illustrated with photographs of children. At the end of each chapter is a list of references, and also an excellent comprehensive bibliography is to be found at the end of the book.

As to contents, the book treats of the child from one year of age through college, under such subjects as the following: physical growth and development, including diet, clothing, and diseases; mental, emotional, and social growth, including early habit formation; constructive discipline, children's questions, etc. The last chapter deals with the most potent factor in the child's life—the family.

The authors are recognized authorities on the subject of child care and training. Both have had long experience working with students in the classroom and with parents. They themselves are parents, which has given them close, firsthand experience in their own family laboratories.

ETHEL GORDON

Growing Out of Babyhood—By William S. and Lena K. Sadler. *New York: Funk & Wagnalls, 1940.* Price, \$2.50.

The above book by the Drs. Sadler is one of many published by them in more than thirty years of practice as physicians and psychiatrists. Their long experience with family problems has well fitted them to deal with this subject. Case examples from their own experiences help to point up their discussions. This particular book is intended as a guide book, especially for parents, as well as for all adults faced with specific problems of the preschool age child. The authors felt that there

was a wealth of material on the physical health of the young child, and so have devoted its pages to the "psychologic, psychiatric, emotional and social problems," of this age.

The first chapter deals with the normal child. Succeeding chapters throughout the book treat of problems in relation to the following: eliminative habits; thumb-sucking and nail-biting; temper tantrums; feeding and sleeping; obedience, discipline and punishment; play, imagination and falsification; sex problems; group adjustment; parent-child relationships. ETHEL GORDON

Dental Health Education and Dental Health Service in Hawaii—*By Guy S. Millberry, D.D.S. Hawaii: Strong Foundation, 1940. 185 pp.*

A careful survey of the dental health program in Hawaii, sponsored by the Strong Foundation, provided material for this stimulating description of one of the outstanding programs in the United States. Following a brief history of the development, the work of the responsible agencies is considered. The Strong-Carter Dental Clinic of Honolulu, with its emphasis on the prevention of dental disease and the preservation of teeth, operates for children in quarters provided at Palama Settlement where limited service is also provided for adults. The Division of Dental Hygiene is organized under able leadership in the Territorial Department of Public Instruction. A system of self-supporting dental clinics has been developed in some of the intermediate and high schools and in rural districts. In 1939, the Legislature provided for a mobile dental unit for the various islands—a mandatory program in the process of development.

The report emphasizes: the valuable prevention work of the Strong-Carter Clinic; the unique law in American legislation which makes instruction in dental health compulsory in the ele-

mentary schools; laws which make it possible for eleemosynary and industrial corporations to provide dental care for their wards or employees by employing dentists or dental hygienists to render the service; the vital interest taken in the problem of dental caries; and the useful research done in the Islands.

Among suggestions offered are: (1) dental care should begin with the pre-school child; (2) a uniform type of dental health record is important; (3) dental care should be provided for parochial and private school children as well as for those in public schools; (4) a dental health service program should be established on a subsidy basis or contributory plan on the plantations which are the largest employers of labor in the Islands (one subsidized program has been in successful operation for five years); (5) a laboratory for dental research would be helpful. This volume is a valuable contribution to the subject of dental health education and service.

IRA V. HISCOCK

Applied Microbiology and Immunology for Nurses—*By Charles Frederick Bolduan, M. D., and Nils W. Bolduan, M.D. 8th ed. rev. Philadelphia: Saunders, 1940. 288 pp. Price, \$2.25.*

Within this small book one finds a discussion of pathogenic bacteria, yeasts, molds, protozoa, rickettsia, viruses and "certain other microscopic animal parasites." The condensing of so large a subject into so small a space presents a difficult task for the authors and undoubtedly accounts for the occasional lack of explanatory detail.

The book is divided into three sections: Part I. General Microbiology, contains 17 chapters; Part II. Special Microbiology, consists of 31 chapters; and Part III. Practical Laboratory Exercises. The arrangement is at times incoherent. For instance in Part I the early chapters which deal with (1) his-

tory, (2) character of bacteria, (3) various methods of studying bacteria, (4) nomenclature, (5) viruses, (6) various destructive age agents, are followed by one on the counting of bacteria. In Part II, 25 chapters on pathogenic organisms are followed by Bacteriology of Milk, Fermented Milks, Bacteriology of Water, Animal Parasites, and Chemotherapy.

It is apparent that the authors appreciate the language difficulty which the subject presents. This may account for the frequent use of the word "germ." However, in the chapter on The Newer Nomenclature the classification of bacteria is reported in terms of changes. Since the beginning student would know neither the new nor the old, this makes difficult reading.

The book contains statements which would not be clear to the beginner. For instance on page 43: "Following the extensive studies of Ehrlich and Bordet in the field of immunity, a number of extremely delicate methods were developed for differentiating bacteria by means of immunity reactions, principally by the method known as 'agglutination.'" See also the discussion on bacteriophage on pages 56-57.

The introduction to the subject of quarantine is interesting, but the discussion of the regulations for each disease makes dull reading.

The book contains much useful and up-to-date information. If it is to be used as a text for student nurses it will need to be supplemented.

LAVERNE THOMPSON

Industrial Housing in Wartime—Results of the Competition Organised by The Royal Institute of British Architects. 66 Portland Place, London W 1, England.

The designs for building given in this booklet while providing primarily for the accommodations required during

war, are capable of adaptation for use when peace comes. While the hostels were considered in many cases the best solution for single men and women, and particularly for boys and girls, under wartime conditions, there is also a demand during the war for accommodation of families of married workers who are being encouraged to move with the bread winner. In addition to designing flexible plans for houses suitable for both family and hostel accommodation and convertible, when peace arrives, for normal family occupation residences, those engaging in this competition were asked to make plans for adequate air raid protection.

In addition to the house plans, estate plans were submitted, and there is a selection of these included in the booklet. Also consideration has been given to protection to the community in the form of camouflage.

The book is authoritative, coming, as it does, from the highest authorities in England, and though designed for English conditions, contains a great deal of interest for us in this country.

MAZYCK P. RAVENEL

Magic in a Bottle—By Milton Silverman. New York: Macmillan, 1941. 332 pp. Price, \$2.50.

Anyone who has visited the medical historians in and around San Francisco will not be surprised that from their rich libraries and richer conversations has come a good popular history of pharmacology. But only when the author was both scientist and journalist, and when he admittedly was put on the trail he followed by as colorful and distinguished a pharmacologist and scholar as Chauncey Leake, could one expect a manuscript as unusual as this. Here are the stories of morphine, quinine, digitalis, cocaine, salvarsan, aspirin, the barbitals, vitamins, hormones and sulfanilamide told with historical accuracy, and in the setting of the economic,

political, social and scientific entanglements in which their discoveries were made or to which they led. Tales of the men who wittingly or unwittingly discovered the drugs are here, too—not in the usual biographical style but in a series of pictures which bring them to life as effectively as a “flash-back” in the movies tells its tale. And for the more earnest reader there is an excellent bibliography of source materials and a less satisfactory index.

LEONA BAUMGARTNER

Natural Resistance and Clinical Medicine—By David Perla and Jessie Marmorston. New York: Little Brown, 1941. 1344 pp. Price, \$10.00.

This is a unique book which has no counterpart in the English literature. The authors have undertaken to bring together, in one volume, the manifold aspects of natural resistance and to interpret their bearing on the modes of infection and immunity. It is refreshing in our days of highly specialized immunochemistry to observe a deliberate return of interest to the fundamental problems of immunology with which this science began; moreover, by laying stress on the modern advances in concept as well as in methods of approach, the authors have been able to substitute a store of precise knowledge in place of scattered empirical observations of earlier days. As it stands, this book is truly a monument to David Perla and his wife, both of whom have been identified with pioneering research in this field.

The breadth of the treatment is in keeping with the scope of the phenomena of natural immunity. It includes a general discussion of genetics and constitutional factors in resistance to infectious diseases, as well as a thorough presentation of the experimental data on age- and sex-linked resistance. The rôle of the endocrine system, particularly the adrenal gland, in natural de-

fense and the function of vitamins in conditioning the reaction of the host to microbial invasion and intoxication are analyzed with a rare lucidity. The discussion of the effect of climate on resistance contains a great many data of value to those engaged in the epidemiological study of infectious diseases. A scholarly analysis of the comparative importance of humoral and cellular mechanisms will interest especially the professional immunologist. While much of the material contained in this treatise is, of necessity, experimental in nature, the authors have not failed to emphasize wherever possible the practical measures of recognized value in preventive medicine. But the book, in spite of its title, will hardly satisfy those who expect a ready answer to purely clinical questions.

The book is admirably organized and reads smoothly. Each chapter has a summary which evaluates the available evidence conservatively and, in case of controversial issues, judiciously. Bibliography and index are exhaustive. *Natural Resistance and Clinical Medicine* can be heartily recommended to anyone with interest in the broader mechanisms of disease production, physician and laboratory worker alike.

C. W. JUNGBLUT

Textbook of Clinical Pathology—Edited by Roy R. Kracke and Francis P. Parker. (2d ed.) Baltimore: Williams & Wilkins, 1940, 780 pp. Price, \$6.00.

Fourteen clinical teachers, all specialists in their line, were chosen to write the material for this book under the able editing of Professors Kracke and Parker.

The theoretical background of all procedures is briefly, but clearly explained where germane to the subject. The material is brief, but explicit and ample. The material is not padded, and gives the whole clinical field of

practical laboratory procedures. Where clinical procedures are to be carried out, emphasis has been placed on the simplest practical one, instead of confusing the reader by a number of them.

The directions for cisterna puncture should be simplified. One cannot look at the forehead while working on the back of the neck. Its dangers have been over-stressed. Our internes do them frequently, but approach the operation with proper reverence.

The newer subarachnoid sacral puncture might well be included. It has a number of advantages in selected cases.

On the whole, the book is an invaluable addition to the library of the modern practising physician.

ALBERT G. BOWER

Mosquito Control: Practical Methods for Abatement of Disease Vectors and Pests—*By William Brodbeck Herms, Sc.D., and Harold Farnsworth Gray, Dr.P.H. New York: Commonwealth Fund. London: Humphrey Milford, Oxford University Press, 1940. 317 pp. Price, \$3.50.*

This book is intended as a practical handbook on mosquito abatement. "It endeavors to present the fundamental principles of mosquito control, emphasizing practical application, geographic variation, and ecological differences in sufficient detail to indicate the main methods of attack on the problem."

After discussing the general principles of mosquito control and the economic loss from mosquitoes, the authors present illustrations of laws and agencies for mosquito abatement in various parts of the United States. They describe approved types of surveys and reports, together with the organization of abatement procedures and the education of the public.

Chapters are devoted to the finding of mosquito breeding places and the various methods of eliminating or controlling them; including drainage and

reclamation of marshes; filling, pumping, and flushing; and the use of oils, chemical larvicides and fish. Protection against adult mosquitoes by means of screening, chemical repellents, and the killing and diverting of mosquitoes are discussed. The special features of mosquito control in urban and rural areas, and the subjects of species sanitation and naturalistic control are considered. A bibliography completes a well rounded presentation of the subject.

Although the authors draw mainly on their own experience on the Pacific Coast, they demonstrate a wide knowledge of the literature on methods employed elsewhere. The one important phase of mosquito control which the reviewer feels is not sufficiently emphasized is the use of concrete inverts in drainage ditches in order to increase their permanence and reduce the cost of maintenance. The usefulness of the book is increased by the inclusion of numerous tables, line-drawings and photographs. This book should be in the hands of everyone participating in malaria control work, and in the library of every institution where instruction in environmental sanitation is conducted. HENRY E. MELENEY

Age Morphology of Primary Tubercles—*By Henry C. Sweany, M.D. Springfield, Ill.: Thomas, 1941. 265 pp. Price, \$5.00.*

Infrequently there is published a new book on an old subject that is decidedly important either because the material is presented from a different point of view or because facts already established are reinterpreted and utilized to provide understanding of a complex and obscure biologic process. Dr. Sweany's monograph is important for both these reasons. It constitutes a well written and authoritative account of work that has been tedious and long, and presents rational and conservative interpreta-

tions of a heretofore largely neglected phase of the so-called primary tubercle of tuberculosis of human beings.

The book has as its objective the correlation of the relationship of the age of the tuberculous individual to morphologic characters of the primary lesion for the purpose of determining the duration or age of the infection. The volume is well illustrated by 73 photomicrographs and roentgenographs of excellent technical quality.

The book begins with a brief but interesting introductory essay on the thesis that most natural biologic processes appear to be regulated by definite although perhaps obscure laws and take place at regular intervals. Then follows the subject matter which is divided into two parts. Part one is concerned with the relationship of morphology to age of primary tubercles. This material is further divided into (1) material from patients in which contact with tuberculous infection began and ended before 7 years of age, (2) material from cases having an accurate history of contact at any time during life, and (3) age characteristics of presumably tuberculous extrapulmonary calcified lesions with special reference to those in the spleen. In part two is considered the practical application of the age-morphology principle established as a consequence to the data presented in part one.

The evolution of the primary tubercle as recounted in part one and the significance of the various cellular constituents that characterize this important entity from its inception to the end stage is a valuable account of important basic facts. While it is true as Sweany points out that the formation of the tubercle is one of the best understood phases of pathology, most of the knowledge gained has been by experimental methods. Dr. Sweany has projected and correlated this knowledge so that one can obtain a fairly definite concept of

the situation as it obtains in human beings.

As to the practical significance of the findings, Dr. Sweany is commendably conservative. He writes "as with any innovation—too much should not be expected in the beginning." From the medico-legal aspect, the facts revealed on the age factor of the lesions of primary tuberculosis should be of assistance in fixing the time of exposure. It is also evident that the data contain information of prognostic value since lesions that are large in size and not calcified are potentially dangerous. Also of serious implications are the so-called soft lesions.

Dr. Sweany's observations and interpretations have demonstrated anew that wider horizons may be revealed by the morphologist with imagination and the will to accomplish a difficult task. His results attest to the importance and practicability of the morphologic approach to problems not only in tuberculosis but in other morbid conditions as well.

Taken in all, this book is a fine contribution to our knowledge of the pathology of tuberculosis. It represents a modern concept of the significance of morbid processes that have previously been seen and described by many, but interpreted and understood by few. The book is the product of a scholarly and well ordered scientific mind and should be read and re-read by pathologists, clinicians, and roentgenologists.

The book contains a comprehensive bibliography and an adequate index. The publisher has properly contributed his part in providing an easily read, well printed, and attractively bound volume.

WILLIAM H. FELDMAN

Psychotherapy—By *Lowell F. Barker*. New York: *Appleton-Century*, 1940. 218 pp. Price, \$2.00.

The growing appreciation that doctors must treat the patient as well as

the disease, is reflected in the frequency with which books like this, intended for the psychiatric orientation of the general practitioner, are appearing. From Dr. Barker's rich experience as an internist of rare competence, the doctor in general practice, whatever his limitations, will learn much of medical and psychological procedures for study and treatment. Defining psychotherapy as "treatment that attempts to improve the condition of a human being by means of influences that are brought to bear upon his mind," Dr. Barker takes up, successively, the making of comprehensive diagnoses, the planning of adequate treatment, the importance of heredity and environment, and the various methods of psychotherapy for organic and functional disorders available at various age levels. The exposition and interpretations are simple, terse, and very readable. A glossary of psychiatric terms, a well chosen bibliography and an index add to the value of this practical and helpful treatise.

PAUL O. KOMORA

America Organizes Medicine—
By Michael M. Davis. New York: Harper, 1941. 335 pp. Price, \$3.00.

It is refreshing to find a book on the organization of medicine which reviews the facts dispassionately. Michael M. Davis is a medical economist of recognized standing. Although he has sometimes been accused of special pleading, in this book certainly he has allowed the facts to do the pleading with little interference from the author. The book is distinguished in that it goes behind familiar slogans to discover their meaning. For example, instead of theorizing about "free choice of physician," it examines the ways in which patients actually choose their physicians today. The same approach is used toward the perplexing questions involved in paying for medical care, organizing professional services, providing care for the indigent,

and extending the scope of public health.

The necessity for encouraging high professional standards and for guaranteeing the status of the physician is emphasized throughout, but the point is also made that the public has the right to participate in health planning. The author's suggestions are timely and realistic. His point of view is summarized in this passage: "The alternative ahead is not, on the one side, individual private practice and, on the other, regimentation of medical services. . . . The basic issue which modern society faces is not the survival of individualism, but *the maintenance of individuality within organization.*"¹

Absorbingly written, this book is a most comprehensive and stimulating treatment of the problem of organizing for all health needs. It should be read by every health official and every physician who desires to keep abreast of what is happening in his profession. There are, of course, those shortcomings inherent in any work which attempts to present a broad subject briefly: much important detail cannot be included. The excellent bibliography to a large extent compensates for this.

DEAN A. CLARK

¹ Author's italics.

A History of Medicine By Arturo Castiglioni. New York: Knopf, 1941. 1013 pp. Price, \$8.50.

Professor Castiglioni's *History of Medicine* has, among many qualities that commend it, this outstanding one: it presents the history of medicine against the broad background of man's cultural development. With but few exceptions, the medical histories that have been written to date have been either very scrupulous, minutely detailed, bulky compendiums of the lives and works of the hundreds of men who have "made" medical history, or else they have been brief, interpretative recita-

tions. But there has long been need for still another type of medical history.

This book admirably fills such a need. It is sufficiently detailed to serve as a reference source, and yet it is compact enough to allow the reader to "gather in the whole" without undue effort. It is also catholic in substance and spirit. Medical history cannot be studied or understood apart from the rest of human history. The growth of medical knowledge and the development of its practices are subject to influence by all the currents of human experiences; by religious faiths; by political and social contests; by industrial changes; by wars, famines and pestilences. To understand what has happened in medicine, one needs to know what has happened to mankind.

The author has the happy faculty of interweaving the threads of human history with those of medical history in such a wise that the whole forms a colorful tapestry, rich in deep perspectives. His catholicity is evident in another regard. He is sympathetic to his subject. He treats the periods and personalities of medical history with an understanding that transcends mere intellectual judgment. It has been a common but poor sport to decry and disparage certain periods in medical history, to point in the conceit of the superiority of our own age to the ignorance, superstition, and quackery that flourished *then*. This practice, worse than poor sport, is bad history. Castiglioni is without this fault, and for this renders a precious service to his reader. He does not gloss over what was faulty or false in the past. He rather sets the whole, good and bad, in the framework of the times. There is less frothy passion in such a presentation, but it makes for better understanding of the subject.

Because of its broad interest and tolerance Castiglioni's *History of Medicine* should prove particularly valuable

to the public health worker, whether medically trained or otherwise. The reference framework to the medical event, the background representation of the important medical advances, are even greater prerequisites for the worker in public health than for the medical clinician.

Castiglioni is a brilliant writer. The translation from the Italian, made by Professor Krumbhaar, renders the crispness and luminosity of the original as faithfully as our more prosaic English will permit. The book is copiously illustrated. This work, then, is highly recommended to physicians and public health workers. IAGO GALDSTON

Publications of the University of Pennsylvania Bicentennial Conference—Medical Sciences: Problems and Trends in Psychiatry—By *Thomas M. Rivers, et al.* Price, 75¢. Therapeutic Advances in Psychiatry—By *Edward A. Strecker, et al.* Price, 50¢. Medical Problems of Old Age—By *Louis I. Dublin, et al.* Price, 50¢. Nutrition—By *Conrad A. Elvehjem, et al.* Price, 50¢. Female Sex Hormones—By *Edward A. Doisy, et al.* Price, 50¢. The Relation of Diseases in Lower Animals to Human Welfare—By *John R. Mohler, et al.* Price, 50¢. Modern Aspects of the Anti-tuberculosis Program—By *J. Burns Amberson.* Price, 50¢. Chemotherapy—By *E. K. Marshall, Jr., et al.* Price, 50¢. A Challenge to Scholarship—By *W. Mansfield Clark.* Price, 50¢. *Philadelphia: University of Pennsylvania Press, 1941.*

One would have to be bold to attempt reviews of this group of essays. There are some 32 authors and the titles show the variety of subjects covered. That any one person could give an adequate review or express an opinion worth having on such a wide range of material is out of the question. The papers were all given during the Bicentennial Conference at the University of Pennsyl-

vania. The authors were selected as being specialists in the subjects which they have discussed.

Everyone knows that the advances in every field of medicine have been so varied and so tremendous that even the most expert finds it difficult to keep in touch with his own specialty.

The essays are mostly historical, telling what has been done, the present status of the subjects discussed, and, in some instances, hinting at the trends of research along the particular lines for the future. No paper carries any startling announcement of a discovery. All are made up practically entirely of material which has already reached the printed page.

We are tempted to mention particularly "A Challenge to Scholarship," by W. Mansfield Clark, which discusses the proper place of research in a university. This can be commended without hesitation to all engaged in or contemplating research, to university authorities, and especially to the heads of departments, in too many of which "... the encouragement of research has become a catchword. . . ."

There is no doubt that these essays have been well considered by those who are competent to judge of the many specialties with which they are concerned. The average reader will pick out a few for special study. There can be no question that they are authoritative, up to date, and written in good style, and as such are useful contributions to our knowledge.

MAZŸCK P. RAVENEL

Hutchison's Food and Dietetics
—By V. H. Mottram, M. A. and George Graham, M.D. (9th ed.). Baltimore:

Williams & Wilkins, 1940. 648 pp. Price, \$6.75.

This book represents the 9th edition of the original work on dietetics written by Sir Robert Hutchison over 40 years ago. The introduction contains an interesting history of dietetics as written by Dr. Hutchison. The book is divided into 4 main divisions dealing with the principles of nutrition and dietetics, nature of foods, diet in infancy, and diet in disease.

The discussion on the principles of nutrition is developed in much the same manner as similar chapters in other texts on dietetics, although the chapter on energy is unusually well written. It is unfortunate that so little space is given to the trace elements and that only three members of the vitamin B complex, thiamin, riboflavin, and nicotinic acid, are discussed.

The chapters on the nature of food are excellent and contain information which should be given greater consideration by students of nutrition. It is interesting that much attention is given to the problem of infant feeding and the use of diet in treating specific disease, but even in this recent book on dietetics no space is devoted to a consideration of diet in advanced age.

C. A. ELVEHJEM

Your Community—By Joanna C. Colcord. New York: Russell Sage Foundation, 1941. 261 pp. Price, \$.85.

This is the second edition of a popular volume discussing community organization, which was fully reviewed in the January 1940 issue of this JOURNAL. The new edition does not differ markedly from the first.

LEONA BAUMGARTNER

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Killing Two Birds—Tetanus toxoid may be combined with diphtheria toxoid to produce immunity against both diseases.

BIGLER, J. A., and WERNER, M. Active Immunization Against Tetanus and Diphtheria in Infants and Children. *J. A. M. A.* 116, 21:2355 (May 24), 1941.

In Eight Per Cent It's the Teeth—Defective teeth, eye diseases, heart conditions are the top three among the causes for rejection of 2 out of every 5 men in the draft age. Though the rejections are higher this does not mean that the health of our young men is worse than in 1918. Undoubtedly it is better.

BRITTEN, R. H., and PERROTT, G. St. J. Causes of Physical Disqualification Under the Selective Service Law. Early Indications. *Pub. Health Rep.* 56, 19:1017 (May 9), 1941.

Polio We Always Have with Us—Only four times since 1914 has the number of poliomyelitis cases exceeded the 1940 figure of 9,770. In the past year the disease was reported in epidemic form over large areas mostly in the north central part of the country. During the year the isolation of virus from stools was studied.

DAULE, C. C. Prevalence of Poliomyelitis in the United States in 1940. *Pub. Health Rep.* 56, 17:871 (Apr. 25), 1941.

They All Can't Be Right—In three comparable counties, the health departments showed striking differences in practice in the handling of communicable diseases, tuberculosis, maternal hygiene, and sanitary services. If such conspicuous differences are typical, they suggest the need for more critical evaluation of what we are trying to do.

DEAN, J. O., and FLOOK, E. How Health Departments Function with Respect to Specific Problems. *Pub. Health Rep.* 56, 18:929 (May 2), 1941.

Plain Enough for All To Grasp—Among 28,331 union members of the New York garment trades who were x-rayed, 1,102 cases of tuberculosis were discovered. Of the clinically significant cases, 53 per cent were in the minimal stage, and 37 per cent moderately advanced.

EDWARDS, H. R., *et al.* Tuberculosis Case-Finding. *Am. Rev. Tuberc.* 43, 4:491 (Apr.), 1941.

What Happens after Sanatorium Care?—Rehabilitation may become a potent factor in the further reduction of tuberculosis mortality. Hence it is important that survivor rates be known. Nearly 11,000 sanatorium "graduates" in Minnesota were followed up to get the reported statistics.

HILLEBOE, H. E. Post-Sanatorium Tuberculosis Survival Rates in Minnesota. *Pub. Health Rep.* 56, 17:871 (Apr. 25), 1941.

Statistics about Trichinosis—Of three thousand diaphragm examinations 16.3 per cent were found positive for trichinae. Most of the infestations were light. This incidence rate is believed to be typical. About 1.5 per cent had sufficient larvae to suggest that the persons must have suffered from clinical trichinosis at some time.

KIEF, K. B., *et al.* Studies on Trichinosis. *Pub. Health Rep.* 56, 16:836 (Apr. 18), 1941.

Milk—Not much is new but the play upon words in the title, but there is plenty that is both sound and important about the production, handling,

and use of milk, and well worth repeating.

McHENRY, E. W. Milk: the Protected, Protective Food (and a dozen related papers in this symposium). *Canad. Pub. Health J.* 32, 4:143 (Apr.), 1941.

Says the Administrator of the Federal Security Agency—Industrial hygiene, medical and hospital care, and nutrition are the immediate health problems which must be tackled as our contribution to the national emergency.

McNUTT, P. V. Special Problems in Our Health Defenses. *Pub. Health Rep.* 56, 19: 988 (May 9), 1941.

Strep—That hemolytic streptococcal infections are important factors in rheumatic fever, is the guarded conclusion reached through this excellent series of reports of scientific research. But whether the streptococci are the only factors remains unanswered, and the mechanism responsible for the rheumatism remains unexplained.

MOTE, J. R., and JONES, T. D. Studies of Hemolytic Streptococcal Antibodies in Control Groups, Rheumatic Fever and Rheumatoid Arthritis. *J. Immunol.* 41, 1:35 (May), 1941.

Pneumonia and Serum—Alternate cases of pneumonia were treated with the sulfonamide drugs alone, and combined drug and homologous serum. The mortality was slightly higher among the cases given the combined therapy. The conclusion is that serum treatment appears to be indicated only for those persons who cannot tolerate the drugs, or who do not respond satisfactorily.

PLUMMER, N., *et al.* Chemotherapy Versus Combined Chemotherapy and Serum. *J. A. M. A.* 116, 21:2366 (May 24), 1941.

Where Tuberculosis Stands First in Cause of Death—Examinations for tuberculosis among women in industry, during pregnancy, after labor, and in many other categories should be continued. This is the conclusion of a

study of tuberculosis incidence in various population groups.

PLUNKETT, R. E., and KATZ, J. Tuberculosis in Young Women. *New York State J. Med.* 41, 9:961 (May), 1941.

School Child Health—Despite the abandonment of the standard height-weight tables, children should be weighed monthly and growth curves plotted as a general index of nutritional status. Special methods, of course, should supplement this general appraisal.

ROBERTS, L. J. Practical Methods for Assessing Nutritional Status. *J. Health & Phys. Educ.* 12, 4:226 (Apr.), 1941.

A "Must" on Influenza—It is said that those who should know best are apprehensive about an epidemic of severe influenza during the coming season. It behooves us all, then, to be primed with the latest and best information about the prevention and treatment of the disease. You'll find just that in this excellent summary. Don't miss it.

SCUPHAM, G. W. The Therapy of Influenza. *J. A. M. A.* 116, 20:2264 (May 17), 1941.

Something to Try on Yourself—Suggested in the hope that it will be given a wide trial is this: for poison ivy dermatitis, rub off the top of the vesicles with alcohol-saturated gauze or clip off with scissors, and paint on a 10 per cent aqueous solution of tannic acid. After a half hour another application is made. The patient is instructed to apply the solution twice during the following day. New vesicles are treated as they appear.

SCHWARTZ, L., and WARREN, L. H. Tannic Acid Treatment of Poison Ivy (*Rhus spp.*) Dermatitis. *Pub. Health Rep.* 56, 20:1039 (May 16), 1941.

Many Don't Know They Have It—Sizing up the premarital blood test situation as it exists in about a quarter of the states across this wide country

the author concludes that the favorable results far outweigh the theoretical objections that have been advanced.

SHEPPE, W. M. The Evaluation of Premarital Legislation. *J. A. M. A.* 116, 18:2006 (May 3), 1941.

Scarlet Fever Immunization — Over a period of 4 years about 65 per cent of the grammar school children in two large counties were immunized with

precipitated scarlatinal streptococcus toxin. Three graduated doses were given at 2 week intervals. The findings are too numerous and important to be abstracted here. Interested sanitarians will want to read the whole paper.

VELDEE, M. V., *et al.* The Dick Reaction and Scarlet Fever Morbidity Following Injections of a Purified and Tannic Acid Precipitated Erythrogenic Toxin. *Pub. Health Rep.* 56, 18:957 (May 2), 1941.

BOOKS RECEIVED

THE STORY OF CLINICAL PULMONARY TUBERCULOSIS. By Lawrason Brown. Baltimore: Williams & Wilkins, 1941. 411 pp. Price, \$2.75.

A MANUAL OF ALLERGY. By Milton B. Cohen. New York: Hoeber, 1941. 156 pp. Price, \$2.00.

EDITH CAVELL. By Helen Judson. New York: Macmillan, 1941. 288 pp. Price, \$2.50.

TOUGHEN UP, AMERICA! By Victor G. Heiser. New York: McGraw-Hill, 1941. 228 pp. Price, \$2.00.

ANNUAL REVIEW OF PHYSIOLOGY. Vol. III. James Murray Luck, Editor. Stanford University: Annual Reviews, 1941. 784 pp. Price, \$5.00.

BIOLOGICAL SYMPOSIA. Vol. III. Muscle. Edited by Jaques Cattell. Lancaster, Pa.: Jaques Cattell Press, 1941. 370 pp. Price, \$3.50.

PROCEEDINGS OF THE FIRST AMERICAN CONGRESS ON OBSTETRICS AND GYNECOLOGY. Cleveland, Ohio, September 11-15, 1939. Fred L. Adair, Editor. Evanston: The Mumm Print Shop, 1941. 907 pp. Price, \$5.00.

MAN'S SUPREME INHERITANCE. By F. Matthias Alexander. New York: Dutton, 1941. 354 pp. Price, \$2.50.

HEALTH EDUCATION. Report of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association with the Cooperation of Advisory Committee. Second revision. Washington: National

Education Association, 1941. 368 pp. Price, \$1.50.

FIRST AID IN EMERGENCIES. By Eldridge L. Eliason. 10th ed. Philadelphia: Lippincott, 1941. 260 pp. Price, \$1.75.

YOUR TEETH. THEIR PAST, PRESENT, AND PROBABLE FUTURE. By Peter J. Brekhus. Minneapolis: Minnesota University Press, 1941. 255 pp. Price, \$2.50.

PLAY FOR CONVALESCENT CHILDREN IN HOSPITALS AND AT HOME. By Anne Marie Smith. New York: Barnes, 1941. 133 pp. Price, \$1.60.

OBSTETRICS FOR NURSES. By Joseph B. DeLee and Mabel C. Carmon. 12th ed. Philadelphia: Saunders, 1941. 651 pp. Price, \$3.00.

AN OUTLINE FOR TEACHING OBSTETRICS TO NURSES. Planned for use with the 12th edition of *Obstetrics for Nurses*. Arranged in 30 lessons.

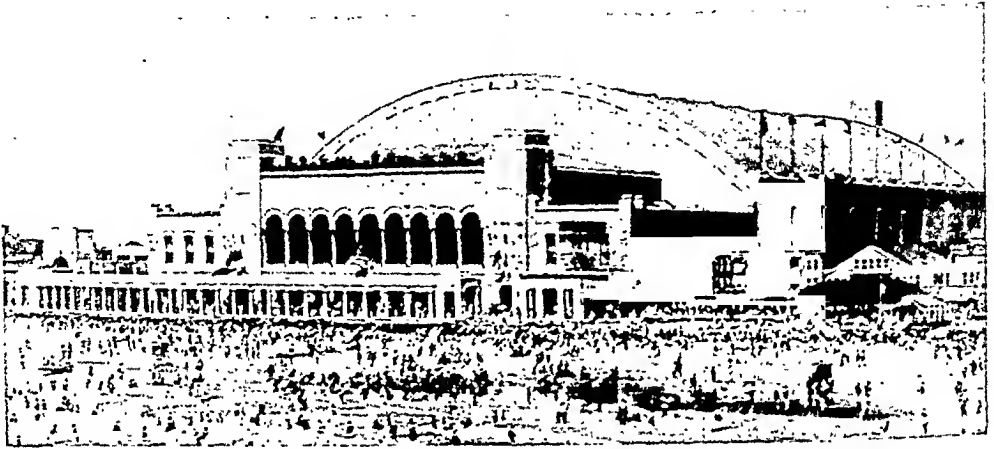
PUBLIC HEALTH AND HYGIENE. By Charles Frederick Bolduan and Nils W. Bolduan. 3d ed. Philadelphia: Saunders, 1941. 366 pp. Price, \$3.00.

BIOLOGY OF THE LABORATORY MOUSE. By George D. Snell, Editor. Philadelphia: Blakiston, 1941. 497 pp. Price, \$7.00.

MEAT FOR MILLIONS. Report of the New York State Trichinosis Commission. Albany: Fort Orange Press, 1941. 282 pp.

EDUCATION FOR FAMILY LIFE, NINETEENTH YEARBOOK, 1941. American Association of School Administrators. Washington: National Education Association, 1941. 368 pp. Price, \$2.00.

ASSOCIATION NEWS



Convention Hall, Atlantic City, N. J.

The 70th Annual Meeting

Atlantic City, N. J.

October 14-17

"What's on the Program for the 70th Annual Meeting?" This question will be answered in full in the August JOURNAL. The General and Special Sessions, the Section meetings, the meetings of related organizations, and, of course, the Eighth Institute on Public Health Education, will be reported in detail, both as to subjects and speakers.

A panoramic view of how the health worker has spent his time in the last year, how he is spending it now, and the things that will engage his attention during the months ahead is presented by the Annual Meeting Program. It is deserving of study by all JOURNAL readers as an over-all picture of what the Section Secretaries and the Program Committee, representing all the interests of the Association, have selected from the broad field of modern public health

as especially significant and important at this time.

The program of the Health Education Institute will be distributed by mail to the members of the Health Education Section before the August JOURNAL is off the press. It will be sent to all others on request. Its content is summarized on an announcement in the advertising pages of this issue.

The Committee on Scientific Exhibits will welcome applications for space for the exhibiting of technical work in progress by individuals or agencies, of results of research, of special activities of health departments and voluntary agencies, and of exhibits designed to educate the public. The Committee on Motion Pictures is assembling films for the motion picture program and invites suggestions from readers.

RAILROAD FARES FROM VARIOUS POINTS TO ATLANTIC CITY, N. J.

*American Public Health Association**October 14-17, 1941*

<i>From</i>	<i>One-way for Pullman Travel</i>	<i>Round-trip for Pullman Travel</i>	<i>One-way Lower Berth</i>	<i>One-way Upper Berth</i>
Atlanta, Ga.	\$24.95	\$39.70(2)	\$6.60(8)	\$5.15(8)
Baltimore, Md.	4.90	9.65(3)	2.65	1.80
Boston, Mass.	11.90	22.60(1)	3.20(8)	2.35(8)
Buffalo, N. Y.	14.30	27.20(3)	3.15	2.20
Chicago, Ill.	26.30	47.70(3)	6.30	4.35
Cleveland, O.	16.15	30.50(3)	3.95	2.70
Dallas, Tex.	46.79	72.40(3)	12.40(8)	9.55(8)
Denver, Col.	57.36	94.30(3)	13.95(8)	10.75(8)
Duluth, Minn.	39.97	68.25(3)	9.50(8)	7.35(8)
Fort Worth, Tex.	47.68	73.70(3)	12.40(8)	9.55(8)
Indianapolis, Ind.	23.35	42.85(3)	6.05	4.15
Jacksonville, Fla.	29.50	46.50(2)	7.90(8)	6.15(8)
Kansas City, Mo.	39.10	67.90(3)	9.45	7.20
Louisville, Ky.	25.15	45.80(3)	6.30	4.35
Los Angeles, Cal.	90.54	138.00(6)	22.60(8)	17.35(8)
Memphis, Tenn.	33.90	53.10(2)	8.95	6.80
Milwaukee, Wis.	28.85	51.55(3)	6.85(10)	4.90(10)
Minneapolis, Minn.	38.51	66.05(3)	8.95(8)	6.95(8)
Nashville, Tenn.	27.65	43.75(2)	7.10	5.40
New Orleans, La.	39.50	61.50(2)	10.00(8)	7.75(8)
New York, N. Y.	4.10	7.00(1)	.80(7)	
Omaha, Nebr.	41.21	70.15(3)	9.50(8)	7.35(8)
Philadelphia, Pa.	2.05	2.30(4) 2.55(5)	.55(7)	
Pittsburgh, Pa.	12.50	23.95(3)	3.15	2.20
Portland, Ore.	90.69	138.00(6)	22.60(8)	17.35(8)
Salt Lake City, Utah	71.09	107.05(6)	17.10(8)	13.15(8)
San Francisco, Cal.	90.54	138.00(6)	22.60(8)	17.35(8)
Seattle, Wash.	90.69	138.00(6)	22.60(8)	17.35(8)
St. Louis, Mo.	30.75	55.35(3)	7.65	5.25
Washington, D. C.	6.05	11.85(3)	2.65	1.80
Montreal, Que.	16.05	32.15(3)	3.70(8)	2.75(8)
Halifax, N. S.	34.70	63.80(1)	8.45(8)	6.35(8)
Ottawa, Ont.	18.35	36.85(3)	4.30(9)	3.35(9)
Quebec, P. Q.	20.65	40.55(3)	5.30(8)	3.80(8)
Toronto, Ont.	18.50	34.80(3)	5.70(8)	2.75(8)
Vancouver, B. C.	90.69	138.00(6)	22.60(8)	17.35(8)

NOTES: (1) 10 day limit (2) 30 day limit (3) 60 day limit (4) 2 day limit
 (5) 4 day limit (6) 3 months limit (7) seat (8) berth to Philadelphia
 (9) seat to Montreal, berth to Philadelphia, seat to Atlantic City
 (10) seat to Chicago, berth to Atlantic City

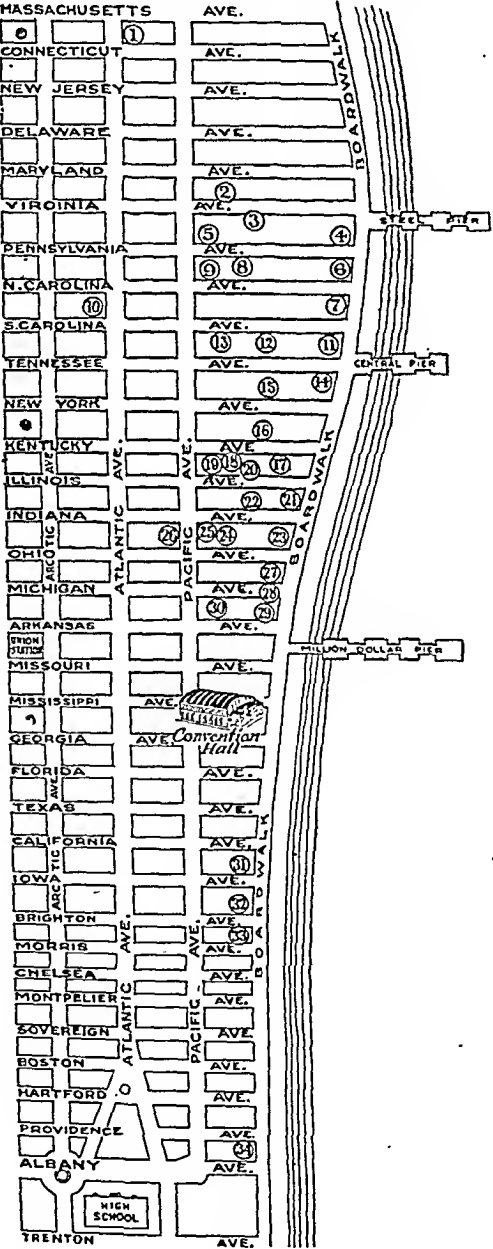
The A.P.H.A. Membership Nomination Blank

On page XXI of this issue of the *Journal* appears a form to be used by members of the A.P.H.A. in nominating other persons for membership. This blank will be carried in the next few issues and we hope that every member will use it at least once.

RATES QUOTED BY ATLANTIC CITY HOTELS
Seventieth Annual Meeting, October 14 to 17, 1941
AMERICAN PUBLIC HEALTH ASSOCIATION

ALL RATES QUOTED ARE FOR ROOMS WITH BATH ON EUROPEAN PLAN
(Rooms without Bath and Two Bedrooms with Bath Between Are Available in Some Hotels)

ATLANTIC CITY



Boardwalk Hotels

Key No.	Single Rooms with Bath	Double Rooms with Bath
32 Ambassador ...	\$3-\$4-\$5-\$6	\$6-\$7-\$8-\$10
22 Brighton	\$3-\$4-\$5	\$5-\$6-\$7-\$8
6-7 Chalfonte-Haddon Hall	\$3-\$4-\$5-\$6-\$8	\$6-\$8-\$10-\$12
33 Chelsea	\$3-\$4-\$5	\$5-\$6-\$7-\$8
28 Dennis	\$3.50-\$4-\$5-\$6	\$6-\$7-\$8-\$9-\$10
14 Knickerbocker	\$3-\$3.50-\$4	\$5-\$6-\$7
11 New Belmont	\$2.50-\$3	\$4-\$5-\$6-\$7
34 President ...	\$3	\$5.50-\$7-\$8
31 Ritz - Carlton	\$3-\$3.50-\$4-\$5	\$5-\$6-\$7-\$8-\$10
4 Seaside	\$3-\$3.50-\$4	\$5-\$6-\$7
29 Shelburne ...	\$4-\$5-\$6-\$8-\$10	\$6-\$7-\$8-\$10-\$12
21 Traymore ...		\$8-\$10-\$12

All hotels offer Suites and DeLuxe Rooms.
Rates can be ascertained by direct correspondence with the individual hotels.

Avenue Hotels

Key No.	Single Rooms with Bath	Double Rooms with Bath
30 Arlington ...	\$3.50-\$4	\$5-\$6
19 Byron		\$4.50-\$5-\$5.50-\$6
8 Colton Manor	\$3-\$3.50-\$4-\$5	\$5-\$6-\$7-\$8-\$9
25 Crillon*		\$5-\$6
26 Eastbourne ..		\$4.50-\$5-\$6
15 Flanders	\$3-\$4	\$5
24 Glaslyn-Chatham		\$5
17 Jefferson	\$3-\$3.50	\$5-\$6
18 Kentucky ...	\$2.50	\$4
9 Lafayette ...	\$3-\$3.50-\$4	\$5-\$6-\$7
20 Madison	\$3-\$3.50-\$4	\$5-\$6-\$7
16 Monticello ...		\$5
3 Morton	\$2.50-\$3-\$3.50-\$4	\$5-\$6-\$7
10 Penn-Atlantic	\$3	\$5
13 Princess	\$2.50	\$4
Runnymede..	\$2.50-\$3-\$3.50-\$4	\$4-\$5-\$6-\$7
12 Senator	\$3-\$3.50-\$4	\$5-\$6-\$7

* Breakfast Included

MORE than 1,000 reservations have already been made in the headquarters hotel—The Traymore—and other nearby hotels. Only double rooms at \$8.00 and up remain in the Traymore. The lower priced accommodations in all hotels naturally go first. Reservations should be made promptly on the form printed below. Please send it to the Hotel Committee, 16 Central Pier, Atlantic City, N. J., and *not* to the Association office.

Between Convention Hall and the Traymore, the Boardwalk hotels where rooms are still available are the Shelburne and the Dennis. Beyond the Traymore, the Knickerbocker, Belmont, Chalfonte-Haddon Hall, and Seaside all offer excellent accommodations. Beyond Convention Hall, there are the Ritz-Carlton, Ambassador, and Chelsea Hotels. Do not overlook the Avenue hotels. Some are removed only a little distance from the Boardwalk, which to many people is no disadvantage.

.....(Cut off on this line and mail to Mr. Morgan).....

APPLICATION FOR HOTEL ACCOMMODATIONS
American Public Health Association

In making application for hotel accommodations, it is necessary that at least three choices of hotels be indicated and that a reasonable range of rates desired be shown. Whenever possible, arrangements should be made for double occupancy of rooms; only a limited number of single rooms are available.

A. J. MORGAN, Chairman
HOTEL COMMITTEE19.....
16 Central Pier,
Atlantic City, N. J.

Dear Sir:—Please make hotel reservations noted below:

Hotel First Choice
Hotel Second Choice
Hotel Third Choice

.... Double Rooms with bath for persons.Rate desired \$.... to \$.... per day
.... Single Rooms with bath.Rate desired \$.... to \$.... per day
.... Suites—Parlor, Bedroom(s) with bath for persons.Rate desired \$.... to \$.... per day
Arriving October, hour A.M. P.M. Leaving

If the hotel of first choice is unable to accept the reservation, the HOTEL COMMITTEE will endeavor to comply with your second or third choice in the order named. You will receive direct confirmation from the hotel accepting the reservation when made.

Rooms will be occupied by:

Name	Street Address	City	State

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

- J. A. Chabot, M.D., Ste-Angele, Roberval, P. Q., Canada, Medical Officer
 Ray L. Drinkwater, M.D., 804 Republic Bldg., Denver, Colo., President, Colorado State Board of Health
 William Levy, M.D., 339 Main St., Suffield, Conn., Health Officer
 Victor Fernandez Manero, M.D., Ayda. del Castillo No. 340, Lomas de Chapultepec, Mexico, D. F., Mexico, Chief, Federal Dept. of Public Health
 Ballard Norwood, M.D., Williamsboro St., Oxford, N. C., Granville County Health Officer
 Chalmers S. Pool, M.D., St. James Hospital Laboratory, Butte, Mont.
 Oscar L. Rogers, M.D., Washington County Board of Health, Sandersville, Ga., Commissioner of Health
 Archibald N. Senesac, M.D., Board of Health, New Bedford, Mass., Agent and Medical Officer
 J. F. X. Stack, M.D., 212 Garden St., Hoboken, N. J., Health Commissioner
 Albert F. Zipf, M.D., C.P.H., 2418 21st St., Bakersfield, Calif., Director of School Health, Kern County Health Dept.

Laboratory Section

- Robert I. Bosman, M.S., Craney Island Laboratory, Box 1834, Norfolk, Va., Teacher, National Youth Administration and U. S. Public Health Service Training Program
 Cooper Brougher, Jr., B.S., State Health Dept., Nashville, Tenn., Associate Director, Div. of Laboratories
 Victor B. Buhler, M.D., General Hospital, Kansas City, Mo., Pathologist, Health Dept. Laboratories
 Jean-Marc Desranleau, B.A., Ministry of Health, 89 Notre Dame East, Montreal, Que., Canada, Assistant Bacteriologist
 George Gillman, 955 Roosevelt Bldg., Los Angeles, Calif., Director, Pacific Medical Laboratories
 Angus M. Griffin, Ph.D., 1335 H. St., N.W., Washington, D. C., Teacher, George Washington Univ., School of Medicine
 Charles J. Hartz, 7937 Cottage Grove Ave., Chicago, Ill., Medical Technician, Century Medical Laboratories

- Samuel H. Hopper, Ph.D., Georgia School of Technology, Atlanta, Ga., Professor of Biology and Public Health
 Ardel A. Janson, 636 Church St., Evanston, Ill., Director, North Shore Clinical Laboratory
 Marvin F. Klang, M.S., 8070 Elgin Ave., Detroit, Mich., Senior Sanitary Chemist, Detroit Sewage Treatment Plant
 Margaret S. LeConey, B.S., 2510 N. Robinson Ave., Oklahoma City, Okla., Consultant Laboratory Technician, Oklahoma State Health Dept.
 William Ludwell Owen, Jr., M.S., 2524 North Boulevard, Baton Rouge, La., Director, The Wm. L. Owen Laboratory
 Ruth P. Dow, M.D., C.M., D.P.H., 2019 Marlowe Ave., Montreal; P. Q., Canada, Bacteriologist, Alexandra Hospital
 Truman S. Potter, M.D., 5748 Harper Ave., Chicago, Ill., Research Associate, Laboratory of Preventive Medicine, Univ. of Chicago
 Mac. C. Sandler, 2016 Wilshire Blvd., Los Angeles, Calif., Medical Director, Wilshire Medical Laboratories
 Paul P. Shuster, A.B., Alexandria Health Dept., Alexandria, Va., City Bacteriologist
 Harry B. Tiedebohl, Ahepa National Sanatorium, Albuquerque, N. M., Technician in charge of X-ray and Laboratory
 Lillian Van de Vere, Y.W.C.A., Ann St., Hartford, Conn., Microbiologist, State Dept. of Health
 Evert Wallenfeldt, M.S., 2238 Hollister Ave., Madison, Wis., Extension Specialist in Dairy Industry, Univ. of Wis.
 Frederick R. Weedon, M.D., 304 Hall Ave., Jamestown, N. Y., Director, Jamestown Municipal Laboratory
 Aimee Wilcox, 874 Union Ave., U.S.P.H.S., Memphis, Tenn., Assistant Technologist, Malaria Investigations, National Institute of Health

Vital Statistics Section

- Ann Dillon, B.A., Tuberculosis Study, Franklin, Tenn., Senior Statistical Aide, State Dept. of Public Health

Engineering Section

- Marvin K. Argenbright, A.B., 32 Kitson St.,

Weston, W. Va., Sanitarian, State Health Dept.

Monroe F. Brewer, B.S., 5049 Page Blvd., St. Louis, Mo., Dairy Plant Engineer, St. Louis Div. of Health

Leo P. Cabana, C.E., 4663 Lacombe Ave., Montreal, Que., Canada, Asst. Superintending Engineer, Dept. of Health

Luis P. Daple, C.E., Calle N 204, Vedado, Habana, Cuba, Engineer, Ministry of Sanitation

J. E. Norris, Augusta St., Indianola, Miss., County Sanitation Supervisor, Sunflower County Health Dept.

Louis S. Payton, C.E., Higginsville, Mo., District Public Health Engineer, State Board of Health

Roland W. Portman, Box 146, Las Animas, Colo., County Sanitarian, Otero-Bent Health Dist.

John W. Wright, B.S., R. F. D. 4, Boise, Ida., Junior Sanitarian, State Dept. of Public Health

Industrial Hygiene Section

Heinrich Brieger, M.D., Dr.P.H., 1452 North 53rd St., West Philadelphia, Pa., Associate in Preventive Medicine, Hahnemann Medical College

Barbara H. Caminita, B.S., 501 N. Lincoln St., Arlington, Va., Junior Bacteriologist, National Institute of Health

James L. McCartney, M.D., 113 West 18th St., New York, N. Y., Medical Director, Wm. R. Warner and Co., Inc.

Artemio Miranda, M.D., 55 Shattuck St., Boston, Mass., Student, Harvard School of Public Health

Miguel Vera, M.D., 1758-Hidalgo Pte, Monterrey, N. L., Mexico, Chief Physician, Cia. Minera de Penoles

Maternal and Child Health Section

Edwin R. Watson, M.D., Georgia Dept. of Public Health, Atlanta, Ga., Associate Director, Div. of Maternal and Child Health

Food and Nutrition Section

Iner M. Eckblad, A.M., 161 West Mountain, Fort Collins, Colo., Extension Nutritionist, Colorado State College

William H. Harrison, Ph.G., 901 Ashland Ave., Wilmette, Ill., Technical Adviser, Continental Can Co., Inc.

Francis J. Lenahan, Ph.G., 4278 25th St., San Francisco, Calif., Food and Dairy Inspector, State Dept. of Health

Kevin G. Shea, Ph.D., 51 Church St., Chicago Falls, Mass., Food and Dairy Consultant

A. Elizabeth Whitney, B.S., 628 Pleasant St., Room 213, New Bedford, Mass., Nutrition Director, Dairy Council of New Bedford

Public Health Education Section

Oliver E. Byrd, Ed.D., Box 3006, Stanford University, Calif., Associate Professor of Hygiene

Max L. Durfee, M.D., M.S.P.H., Iowa State Teachers College, Cedar Falls, Iowa, Director of Health Service

William E. Painter, A.M., R 6, Box 20, Sappington, Mo., Dairy Farm Inspector, City of St. Louis

Frederick W. Rotthoff, 605 Ross Ave., Wilkinsburg, Pa., Sanitarian, Borough of Wilkinsburg

John S. Shiff, B.S., State Dept. of Public Health, Capitol Bldg., Springfield, Ill., Assistant Supervisor of Health Education

Public Health Nursing Section

Ann Castellanos, R.N., Beans Bldg., Room 409, San Jose, Calif., Secretary and Coordinating Nurse, Santa Clara County Tuberculosis Assn.

Dorothy E. Collard, R.N., Latah County Health Unit, Moscow, Ida., Senior Staff Nurse, State Dept. of Public Health

Myrtle Y. Mullins, R.N., 147 Court Ave., Weston, W. Va., Public Health Nurse, State Health Dept.

Hattie T. Samples, 209 Pine St., Charleston, W. Va., Public Health Nurse, Clay County Health Dept.

Ruth M. Scott, B.S., 1098 W. Michigan St., Indianapolis, Ind., Consultant Nurse, State Board of Health

Eleanor Stockton, A.B., 724 Phelan Bldg., San Francisco, Calif., Director, James D. Phelan Foundation

Epidemiology Section

Anne M. Bahlke, M.D., M.P.H., State Dept. of Health, Albany, N. Y., Physician-in-Training

John N. Eisman, M.D., 1050 Barry Lane, Cincinnati, Ohio, Student, Johns Hopkins School of Hygiene and Public Health

Paul R. Slater, M.D., 606 Cedar St., Burlington, Iowa, Epidemiologist, Upper Mississippi River Basin Malaria Survey

Alton A. Smohl, M.D., 1775 Walton Ave., New York, N. Y., Medical Consultant, Bureau of Social Hygiene, Dept. of Health

Henry van Zile Hyde, M.D., Bureau of Pneumonia Control, State Office Bldg., Albany, N. Y., Acting Director

Harry Weiss, M.D., 1412 Park Ave., New York, N. Y., Practitioner Physician

Unaffiliated

Dr. Bruno Viana Castillo, 632 Church St.,
Ann Arbor, Mich., Student, Univ. of
Michigan

Albert R. Cunningham, 130 Brown Ave.,
Turtle Creek, Pa., Sanitarian, State Dept.
of Health

Peter J. A. Cusack, A.B., 530 East 88th St.,
New York, N. Y., Executive Secretary,
National Foundation for Infantile Paralysis,
Inc.

DECEASED MEMBERS

J. Roslyn Earp, Dr.P.H., Albany, N. Y.,
Elected Member 1923, Elected Fellow 1927
Anncke Kollwijn, Cortez, Colo., Elected
Member 1939

Aurora S. Nelson, Hill City, Kansas, Elected
Member 1939

Matthias Nicoll, Jr., M.D., Rye, N. Y.,
Elected Member 1917, Elected Fellow 1922

Edwin T. Ramsey, M.D., Clark, S. D., Elected
Member 1920

CLOSING DATE FOR SUBMITTING FELLOWSHIP APPLICATIONS

MEMBERS who may be interested in applying for Fellowship in the A.P.H.A. are hereby advised that Fellowship applications should be received not later than August 1, to insure consideration at the 70th Annual Meeting.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

POSITIONS AVAILABLE

Southern State Department of Health seeks physicians qualified by training and experience as County Health Officers or as Pediatricians. Write A.P.H.A. Box B.

Western State Department of Health will consider applications from physicians with experience and a degree in Public Health. Write A.P.H.A. Box S.

Director of County Health Unit, large southern metropolitan area over 200,000, duties to include the direction of complete generalized program. Applicant must have M.D., M.P.H., with satisfactory experience in administration and technical phase of public health work. Salary dependent upon experience and training. Opportunity for advancement assured. Box W, A.P.H.A.

Sanitary Chemist for sewage laboratory in Eastern city. Salary \$2,000. Graduate preferred. Write Box V, Employment Service, A.P.H.A.

Physician with public health training to serve as full-time county health officer in rural South Atlantic area. Salary \$3,600 to \$4,000. Write Box C, Employment Service, A.P.H.A.

County Public Health Nurses for New

Mexico. Must have 4 months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, New Mexico.

U. S. CIVIL SERVICE COMMISSION

The Commission has announced that applications will be received for positions as Senior Medical Officer (\$4,600), Medical Officer (\$3,800) and Associate Medical Officer (\$3,200) for appointments in the Public Health Service, with the Food and Drug Administration, Veteran's Administration, and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington.

The Commission also announces that applications may be filed for the positions of Public Health Nurse (\$2,000) and Graduate Nurse, general staff duty (\$1,800) in the Indian Field Service, including Alaska. Forms may be obtained from the U. S. Civil Service Commission, Washington.

POSITIONS WANTED

ADMINISTRATIVE

A physician with M.P.H. from Johns Hopkins 1924, experienced as state director for communicable diseases, as county health officer, and as director of field training center will consider a responsible position with good income. A483

Physician, aged 39, excellent graduate training and experience in public health, specialized in tuberculosis and epidemiology, now employed, will consider position with salary of \$4,500 or better. A473

Physician, aged 44, graduate of Rush Medical, completing work at Johns Hopkins for M.P.H. and experienced as director of rural unit, will consider opening. A480

Experienced physician, graduate University of Illinois, M.P.H. Johns Hopkins 1940, seeks administrative opening suitable to his proven ability. Excellent references. A465

Physician with M.P.H. from Johns

Hopkins and 10 years' field experience in responsible position with leading state health department, will consider good opening. A481

Physician, graduate of University of Iowa, candidate for Dr.P.H. at Harvard, seeks good administrative position. A476

Physician, aged 40, M.D. University of Minnesota, C.P.H. and Dr.P.H. Johns Hopkins, experienced in epidemiology and venereal disease control, will consider interesting position. A482

Physician, specialist in maternal and child health. M.D. University of Kansas, M.P.H. Harvard. Excellent background in pediatric residencies, experience in municipal and county health work and as director of maternal and child health in state health departments. Desires position as director of a state program, as pediatrician, or in school or college health program. A479

Dentist, University of Pittsburgh,

D.D.S., M.P.H. University of Pennsylvania 1941, experienced in practice, wishes an administrative position in public health, preferably at state level. M450

HEALTH EDUCATION

Director of Health Education, woman. Knows fields of education and health education. National and state experience in organization, supervision, curriculum building, and teacher education. Now employed but would consider a change. H495

Young woman with Master's degree in Health Education, Teacher's College, Columbia University, and background of clinical laboratory work and biochemistry, seeks position as health educator in research or as laboratory assistant in public health. H494

Health educator with excellent background of teaching experience in schools. M.S.P.H. University of Michigan. Wishes position where skill with educational sound film projection and other recognized techniques will be appreciated. H405

LABORATORY

Laboratory Director. Unusually well qualified and experienced man, aged 41, Ph.D. with training at Michigan, M.I.T., and Maryland, excellent references. Will consider administrative, teaching or research position in public health. L459

Experienced woman bacteriologist, now

employed, graduate Iowa State College 1925, 6 months on Fellowship at Johns Hopkins 1930, wishes position in serology, bacteriology or research. L458

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology, and serology, will consider opening. L427

SANITARY ENGINEERING

Engineer, aged 38, 3 years' experience as district sanitary supervisor, state department of health, together with work on plumbing, heating and ventilation, will consider position in the plumbing or heating field or state department of health. Prefers middle western or western states. E453

Engineer with good training and experience in water treatment, sewage plant operation, and in research, wishes position as superintendent. Can go anywhere. E422

STATISTICAL

Public Health Statistician. Young man, M.S.P.H. Michigan, now employed as supervisor of state health project, experienced in medical economic research, epidemiology studies and vital statistics, seeks position in city or state health department in midwest. S458

Advertisement

Opportunities Available

BACTERIOLOGISTS—Senior and junior bacteriologists for municipal health department laboratories; some experience public health laboratory procedures desirable, but not required; maximum entrance stipend; senior, \$2,000; junior, \$1,500. PH7-2, Medical Bureau (Burnice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIANS—(a) For appointment as commissioner of maternal and child health; central state. (b) School physician; appointment under jurisdiction municipal board of health; city of 300,000; Midwest. (c) Venereal disease clinician; recent graduate interested but not necessarily trained, in venereal disease work preferred; about \$3,200; East. (d) Rural health commissioner; public health training available to men interested but not trained in this field; South. (e) Public health physician, preferably with some clinical experience in tuberculosis work (particularly fluoroscopy); duties will include conducting well baby conferences, doing fluoroscopy in tuberculosis survey clinic, some communicable disease work; women physicians eligible; California. PH7-3, Medical Bureau (Burnice Larson, Director), Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—(a) To head department in university averaging enrollment

of over 1,000 students; man under 45 required; about \$4,000. (b) For student health service of large north central university; fairly recent graduate eligible. (c) To organize and direct department of student health in eastern college for men; institution denominational, but not sectarian; Protestant required. (d) Two year fellowship in student health; recent graduate eligible; duties will include teaching, research; eastern university. PH7-4, Medical Bureau (Burnice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—(a) Educational director; well established community health organization in large metropolis; academic and public health nursing degrees required; salary range, \$160-\$250, depending upon qualifications. (b) For follow-up work in tuberculosis control program; \$150; car and car maintenance provided; Pacific Coast. (c) County health nurse; \$135-\$150; West. (d) For newly organized community nursing service; initiative and organizing ability important; South. (e) School nurse; must be certified; retirement plan similar to that for teaching profession effective this fall; interesting opportunity. (f) To assume direction of outpatient department, fairly large hospital in New York State; must be eligible New York registration. PH7-5, Medical Bureau (Burnice Larson, Director), Palmolive Building, Chicago.

*Advertisement*OPPORTUNITIES AVAILABLE (*Cont.*)

BACTERIOLOGIST—Preferably physician, also familiar with public health work; duties will include teaching of medical bacteriology, immunology, and public health laboratory methods; qualifications must include ability to

conduct independent research, record of contributions to scientific literature; university medical school; vicinity \$4,000. PH7-1, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

Situations Wanted

PUBLIC HEALTH PHYSICIAN—Medical degree from midwestern school; M.S.P.H., University of Michigan; 2 years, assistant, state public health service. PH7-6, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Graduate of eastern training school; B.S. degree in Public Health Nursing, Columbia; 10 years, director of nurses, public health nursing association; 5 years, field supervisor, large industrial company; 3 years, educa-

tional director and supervisor, visiting nurse association; available immediately. PH7-7, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

BACTERIOLOGIST—B.S., M.A., Ph.D., large university; splendid experience in teaching and research; 8 years, hospital, metropolitan area. (Burneice Larson, Director), Chicago.

THE NEW YORK MEDICAL EXCHANGE

Public health physician, age 50, married, M.D. from McGill, C.P.H. and M.P.H. Johns Hopkins, licensed in Michigan, Illinois and British Colonial registration, past 14 years with a department of health in the midwest, will con-

sider foreign or domestic appointment, salary desired at least \$4,800. For further particulars, write Patricia Edgerly, Director, New York Medical Exchange, 489 Fifth Avenue, New York, N. Y.

NEWS FROM THE FIELD

TWELFTH ANNUAL MEETING OF THE WESTERN BRANCH, A.P.H.A.

SAN DIEGO was host to the 1941 meeting of the Western Branch and related groups, May 25-29. The Local Committee was under the Chairmanship of Dr. Alex M. Lesem, Health Officer of San Diego, and a full scientific program was arranged by a committee under the Chairmanship of James G. Stone of Los Angeles.

Although missing the customary participation from health workers in the Canadian provinces, the attendance from the 11 western states was excellent.

Preliminary conferences included those of state supervising nurses, persons in charge of maternal and child health and crippled children services, the sanitarians, the registrars and vital statisticians, and a meeting of the California State Board of Public Health was held during the sessions.

The program centered largely on the problems of public health in national defense. The keynote address was given by Dr. William P. Shepard of San Francisco, President of the Western Branch. Other papers covered housing, maternal and child health, venereal disease control, and sanitation, as they relate to defense. Reports were presented by several committees of the Western Branch, including the annual summary on sylvatic plague.

Dr. John J. Sippy of Stockton, Calif., became President of the Western Branch and Dr. Donald G. Evans, State Health Officer of Washington, was elected President-elect.

The following 1941-1942 officers were elected:

President—John J. Sippy, M.D., Stockton, Calif.

President-elect—Donald G. Evans, Seattle, Wash.

Vice-President—Lucille Perozzi, Portland, Ore.

Vice-President—L. J. Peterson, Boise, Ida.

Vice-President—W. W. White, Reno, Neva.

Secretary—W. F. Higby, San Francisco, Calif.

Treasurer—Guy S. Millberry, San Francisco, Calif.

Participants in the program from outside the territory of the Western Branch included:

Reginald M. Atwater, M.D., New York, N. Y.

Carl E. Buck, Dr.P.H., New York, N. Y.

Naomi Deutsch, Washington, D. C.

Margaret R. Harrison, New York, N. Y.

Benjamin G. Horning, M.D., New York, N. Y.

Pearl McIver, Washington, D. C.

Louis Schwartz, M.D., Bethesda, Md.

William F. Snow, M.D., New York, N. Y.

Fred Stimpert, Ph.D., Detroit, Mich.

W. H. Wright, Ph.D., Washington, D. C.

PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

THE Public Health Association of New York City held its Fifth Annual Meeting at Hotel George Washington in the Borough of Manhattan on May 22.

At the afternoon meeting, Thomas Duffield, Registrar of Records of the Department of Health of the City of New York, presented the statistical picture of mortality from diabetes, the heart diseases, cancer, and other leading causes of death in the city. Dr. Frederick W. Williams, a member of the Board of Directors of the New York Diabetes Association, described the public health aspects of that disease. Dr. J. Hamilton Crawford, Professor of Clinical Medicine of Long Island College Hospital, outlined the various problems in connection with the heart diseases. Dr. C. C. Little, Managing Director of the American Society for

the Control of Cancer, spoke of the public health, institutional, and clinical aspects of cancer.

At the Annual Dinner Meeting, Dr. Arthur I. Blau, President, presided. The speaker of the evening was Dr. Haven Emerson, Professor Emeritus of Public Health Practice of the DeLamar Institute of Public Health. Dr. Emerson took as his theme, "A Personal Credo of Public Health for New York City."

Dr. John L. Rice, Commissioner of Health of the City of New York, also spoke briefly.

The following officers were elected:

President—Arthur I. Blau, M.D.
Vice-Presidents—Helen C. Manzer, Ph.D.,
 Alfred E. Shipley, M.D.
Secretary-Treasurer—Frank Kiernan.
Representative to the Governing Council of the A.P.H.A.—Frank Kiernan.

CORNELL RECEIVES GRANT

AN appropriation of \$600,000 has been granted to Cornell University Medical College by the Rockefeller Foundation, for the endowment of the Department of Public Health and Preventive Medicine. The \$600,000 fund in effect capitalizes an annual grant of \$28,000 which the department has been receiving from the Rockefeller Foundation for the last 5 years. The endowment will enable the college to expand its public health teaching both for medical students and for personnel of the City Department of Health.

NEW OFFICERS OF THE NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

AT a recent Annual Meeting the Northern California Public Health Association elected the following officers to serve for the year 1941:

President—Fred T. Foard, M.D., San Francisco
President-elect—John D. Fuller, M.D., Santa Cruz

Immediate Past President—I. O. Church, M.D., San Leandro
Vice-President—Dwight M. Bissell, M.D., Salinas
Secretary—Ann W. Haynes, San Francisco
Treasurer—Helen Hartley, Stockton
Representative on Governing Council of A.P.H.A.—I. O. Church, M.D.
Representative, Regional Board, Western Branch, A.P.H.A.—Nina Simmonds, Sc.D., San Francisco

NEW YORK HEALTH TEACHING SUPERVISORS

THE annual meeting of the Health Teaching Supervisors of New York State was held in Albany, N. Y., on May 7 and 8. At this time plans were completed for the organization of the New York State Council on Health Teaching.

The following officers were elected:

President—Mary Rappaport, Onondaga Health Association, Syracuse, N. Y.
Vice-President—Mary E. Bowen, Department of Education, Syracuse, N. Y.
Secretary-Treasurer—Iva B. Bennett, Baldwin High School, Baldwin, N. Y.

The President, Mary Rappaport, was asked to appoint a committee to draw up a constitution and by-laws for the Council. This report will be presented at the December meeting of the New York State Health and Physical Education Association, to be held in Syracuse.

ANNUAL MEETING OF MISSOURI PUBLIC HEALTH ASSOCIATION

THE 17th annual convention of the Missouri Public Health Association was held in St. Louis, Mo., May 15, 16, and 17, 1941.

The highlights of the meeting were addresses by Harry S. Mustard, M.D., J. J. Bloomfield, Halbert L. Dunn, M.D., and Ruth Kahl, R.N. Interesting sectional programs were provided for the health officers, sanitary engineers, public health nursing and vital statistic sections of the Association. A substantial increase in membership was reported.

The following officers were elected for the coming year:

President—James W. Chapman, M.D., Shelbyna

First Vice-President—Abner Beard, Kirksville

Treasurer—Madge Proctor, Jefferson City

Secretary—Glen J. Hopkins, Jefferson City

MEETING OF GEORGIA PUBLIC HEALTH ASSOCIATION

AT its Annual Meeting held in Atlanta, May 29 to 31, the Georgia Public Health Association elected the following officers for the coming year:

President—J. E. Lester, M.D., Marietta

President-elect—E. J. Sunkes, Atlanta

Vice-President—Susie Turk, Toccoa

Secretary-Treasurer—Louva G. Lenert, Atlanta

Representative on A.P.H.A. Governing Council—Louva G. Lenert, Atlanta

NEW OFFICERS OF PENNSYLVANIA PUBLIC HEALTH ASSOCIATION

AT its Annual Meeting held at Wilkes-Barre on May 28, the Pennsylvania Public Health Association elected the following officers to serve for the coming year:

Honorary President—John J. Shaw, M.D., Harrisburg

President—Col. A. Parker Hitchens, M.D., Philadelphia

President-elect—Arthur M. Dewees, Philadelphia

Vice-President—Henry J. Benz, M.D., Pittsburgh

Executive Secretary-Treasurer—C. E. Houston, Washington

PERSONALS

Central States

CARLETON DEAN, M.D.,* has resigned as Deputy Health Commissioner and Director of local health service, Michigan State Department of Health, to become Medical Director of the Michigan Crippled Children's Commission in Detroit. Dr. Dean

was for 9 years Health Officer of the district unit at Charlevoix.

CLAIRE E. FOLSOME, M.D., formerly Field Consultant in Obstetrics for the Michigan State Department of Health, has been appointed Executive Director of the Committee on Maternal Health, the name of which is now being changed to the Research Council on Human Reproduction, Inc. Dr. Folsome succeeds Dr. RAYMOND R. SQUIER who returns to private practice.

WESLEY M. HALL, M.D., Rising Sun, Ind., has been appointed to succeed the late Dr. GEORGE H. HANSELL as Health Commissioner of Ohio County.

EARL E. KLEINSCHMIDT, M.D.,* Associate Professor and Chairman of the Department of Public Health, Preventive Medicine and Bacteriology at Loyola University School of Medicine, has been granted leave of absence for 3 months to work in Washington making plans for the protection and guidance of students employed in vocational training for defense work in industry.

ELDRED V. THIEHOFF, M.D.,* of Detroit, Mich., has been appointed Acting Deputy Health Commissioner and Director of the Bureau of Local Health Service, Michigan State Department of Health, Lansing. Dr. Thiehoff was formerly Assistant Director in the Bureau of Local Health Services, working with county and district health departments.

Eastern States

MORTON H. CHAPNICK, M.D., has been appointed Health Officer of Thompson, Conn.

ROY C. FERGUSON, M.D., Rockville, Conn., has been appointed Health Officer of Vernon.

EDWARD J. FINN, M.D., has been appointed Health Officer of Shelton, Conn.

* Fellow A.P.H.A.

† Member A.P.H.A.

IRWIN GRANNISS, M.D.,† Saybrook, Conn., has been made Health Officer of the Borough of Fenwick, Old Saybrook.

STANLEY H. OSBORN, M.D., C.P.H.,* was recently reappointed by Governor Hurley of Connecticut as State Commissioner of Health for a term of six years. Dr. Osborn has been in his present position since 1922. The appointment, effective July 1, requires no legislative confirmation.

Southern States

AUBREY A. ADEN, M.D., Yazoo City, Miss., has been appointed Health Officer of the Benton-Tippah Health Unit.

JOHN O. BARFIELD, M.D.,† formerly of Miami and Apalachicola, Fla., has been appointed Director of the City-County Health Department at Panama City.

LEE SCOTT BARKSDALE, M.D., of Hopewell, Va., has resigned as health officer to enter private practice.

ADRIAN L. CARSON, JR., M.D.,* Acting Head of the Bureau of Maternal and Child Health in the State Department of Health, Richmond, Va., since the retirement of Dr. Bathurst B. Bagby, in July, 1940, has been made full Director of that Bureau. Previously, he was a member of the staff.

WILLIAM W. CARTER, M.D., of Corsicana, Tex., has succeeded Dr. Orho C. Bowmer as Health Officer of Navarro County.

CLIFFORD B. COLE, M.D., of Dyersburg, Tenn., has been appointed Health Officer of Fayette County to succeed Dr. HENRY N. MOORE. Somerville, who resigned to enter private practice.

LELAND H. DAMF, M.D.,‡ of Jasper, Fla., has been appointed Health Officer for Highlands and Glades

Counties, succeeding Dr. ERWIN F. HOFFMAN, of Sebring, who resigned. JEWEL G. GAINES, M.D., formerly of Blountstown, Fla., has been named Commissioner of Health of Muscogee County with offices in Columbus.

GEORGE E. GIBBONS, M.D., has been appointed Health Officer of the Noxubee County, Miss., Health Unit.

GEORGE A. GRAY, M.D.,† Sweetwater, Tex., recently director of the Sweetwater-Nolan County Health Unit, has been appointed Director of a new unit for Abilene and Taylor County.

CHARLES W. HARWELL, M.D., has been named Health Commissioner of Crisp County, Cordele, Ga.

HERBERT A. HUDGINS, M.D.,† Winston-Salem, N. C., has been elected Health Officer of the Rutherford-Polk health district.

WILLIAM K. McDOWELL, M.D.,† Scotland Neck, N. C., has been appointed Health Officer of Richmond County with headquarters at Rockingham.

JULIAN T. MILLER, M.D., has resigned as Health Officer of Portsmouth, Va.

LARIED S. OATES, M.D., of Center, Tex., has been appointed Health Officer of Shelby County to succeed Dr. WILLIAM SPENCER WARREN, of Center.

THOMAS J. PENNINGTON, M.D., has been named Health Officer of Nacogdoches County, Tex.

WILLIAM H. PICKETT, M.D.,‡ of Jacksonville, Fla., Assistant State Health Officer, has been appointed State Health Officer to fill the unexpired term of Dr. ALBERT B. MCCREARY, who died.

JOHN C. POWELL, M.D., Coldwater, Miss., has been appointed Health Officer of Prentiss County.

JAMES STEWART, M.D., Jefferson City, Mo., physician, formerly of St. Louis, was appointed State Health Commissioner, to succeed Dr. HARRY F. PARKER. Dr. Stewart was State

* Fellow A.P.H.A.
† Member A.P.H.A.
‡ Member A.P.H.A.

Health Commissioner from 1925 to 1933.

RALPH E. WEDDINGTON, M.D.,† Fort Smith, Ark., has been appointed Health Officer of Independence County, succeeding DR. GARDNER H. LANDERS, Batesville, who resigned to join the military forces.

MYRON E. WEGMAN, M.D.,† pediatric consultant of the Bureau of Child Hygiene of the Maryland State Department of Health since 1936, has resigned to accept an appointment as Assistant Professor of Child Hygiene, in the School of Tropical Medicine, of the University of Puerto Rico, under the auspices of Columbia University, New York, and as Assistant Director of the Division of Education and Research, in charge of Child Hygiene, in the Insular Department of Health.

FRANK E. WILSON, M.D.,† Tarboro, N. C., has resigned as Health Officer of Edgecombe County to take a course in public health at the University of North Carolina.

HARRY E. WRIGHT, M.D., formerly of Dallas, Tex., has been appointed

Health Officer of Marshall County, Tenn.

Western States

CHARLOTTE SINGER BROOKS, M.D., has joined the staff of the Santa Barbara County, Calif., Health Department as Assistant Medical Officer after receiving her public health degree.

CECIL R. FARGHER, M.D.,* of Vancouver, Wash., has been named Health Officer of Vancouver and of Clark County.

THOMAS D. ROBERTSON, M.D., of Portland, Ore., has been appointed a member of the State Board of Health to succeed the late DR. ROY A. PAYNE.

Deaths

GEORGE ALEXANDER GORDON, M.D., of Hamilton, Mont., former Health Officer, died on February 24.

HENRY H. SUGG, M.D., of Mount Vernon, Ind., formerly Secretary of the Board of Health, and County Health Officer, died on March 4.

HENRY EDMUND VITOU, M.D., of South Bend, Ind., former Health Officer, and for many years a member of the city Board of Health, died on February 15.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

American Association of Public Health Dentists. Annual Meeting. Lamar Hotel, Houston, Tex. October 26-28.

American College of Surgeons. Hotel Statler, Boston, Mass. November 3-7.

American Congress of Physical Therapy—20th Annual Scientific and Clinical Session. The Mayflower Hotel, Washington, D. C. September 1-5.

American Dietetic Association—24th Annual Convention. Hotel Jefferson, St. Louis, Mo. October 20-23.

American Hospital Association. Atlantic City, N. J. September 15-19.

American Physiotherapy Association—20th Annual Conference. Lagunta Court, Stanford University, Calif. July 13-18.

(Graduate Program in Physical Therapy, sponsored by the American Physiotherapy Association. Stanford University Medical School, San Francisco, Calif. June 23-July 18.)

American Public Health Association—70th Annual Meeting. Convention Hall, Atlantic City, N. J. October 14-17.

American Society of Civil Engineers—Summer Meeting. San Diego, Calif. July 23-25.

American Water Works Association—Western Pennsylvania Section—Lawrence Hotel, Erie, Pa. August 7-9.

New York Section—Hotel Queensbury, Glens Falls, N. Y. September 11-12.

Rocky Mountain Section—Lafonda Hotel, Santa Fe, N. M. September 18-19.

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A Tuberculosis Control Program

For Institutions in the New York State Department
of Mental Hygiene

ROBERT E. PLUNKETT, M.D., AND
WILLIAM J. TIFFANY, M.D.

*General Superintendent of Tuberculosis Hospitals, New York State Department
of Health; and Commissioner, New York State Department
of Mental Hygiene, Albany, N. Y.*

THE New York State Departments of Health and Mental Hygiene have been aware for several years of the seriousness of the tuberculosis problem inherent among approximately 86,000 inmates and 19,000 employees in the 26 institutions for mental diseases and schools for mental defectives under the control of the Department of Mental Hygiene. Although diagnostic and treatment facilities are available in some of these institutions, the cost of providing adequate x-ray service to all has been the principal deterrent in the establishment of uniform, acceptable tuberculosis control programs in all the institutions. With the development and improvement of equipment providing smaller and less costly x-ray films, plans were advanced jointly by the two departments to meet the problem.

The seriousness and significance of tuberculosis among inmates is strikingly revealed by a review of available data

relating to mortality, morbidity, communicability, and cost of this disease in such institutions.

MORTALITY

The average death rate from tuberculosis in institutions for mental diseases and mental defects is approximately twelve times that for the population as a whole. The death rate ranges from approximately 100 per 100,000 in one institution to 1,497 per 100,000 in another. The average death rate during the three years 1937-1939 was 614 per 100,000 as compared with 51 per 100,000 for New York State.

MORBIDITY

Studies made by the Department of Health and others indicate that between 3 and 5 per cent of inmates of such institutions have active tuberculosis. A recent x-ray study of 1,000 patients in Binghamton State Hospital revealed

that 4.7 per cent of the patients x-rayed had previously unrecognized, clinically significant tuberculosis. Another study recently made by the staff of one of the state tuberculosis hospitals (Hermann M. Biggs Memorial Hospital) at Willard State Hospital, revealed that, among 3,176 patients, 9.1 per cent showed x-ray evidence of reinfection tuberculosis, of whom more than one-third had active disease. Moreover, reëxamination of 2,414 of these patients 12 to 18 months after the first x-ray revealed 15 new cases which had developed during this interval.

COMMUNICABILITY

The Willard State Hospital study also revealed that, of 794 employees x-rayed, 27, or 3.4 per cent, showed evidence of reinfection type tuberculosis, of whom 11 were clinically significant. All these cases of tuberculosis were found among the 425 employees who were engaged in direct and intimate service to patients on the wards. One year after the original survey, 4 new cases of tuberculosis had developed in this group of employees.

There are 4 state tuberculosis hospitals in upstate New York, each of which maintains an active case and contact register for the counties served by the hospital. In Seneca County with a population of 22,744 (the county in which Willard State Hospital is located), of a total of 81 cases of tuberculosis on the register when the survey was undertaken, 19, 23 per cent, were or had been employed at Willard State Hospital. The discovery of 7 of these cases among employees at Willard within 18 months prompted the survey of the institution.

COST

During the past 5 years, the New York State Insurance Fund has expended more than \$900,000 for medical and nursing care and compensation for

120 cases of tuberculosis which were declared compensable and which had developed among 17,000 employees of the Department of Mental Hygiene. This represents an average of almost \$8,000 per case, and confirms the results of previous studies on the cost of tuberculosis made by the Division of Tuberculosis of the State Department of Health.

Recent developments in photographing the image on the fluoroscopic screen by the use of either 35 mm. or 4 x 5 in. films have opened new channels of opportunity for more extensive use of x-ray in case finding on a practical, economical, and fairly accurate basis. A study to determine (a) technical factors in making exposures and processing small size films, and (b) relative ease and dependability of interpretation as compared with 14 x 17 in. films, was made at Binghamton State Hospital. Each of 1,000 inmates was x-rayed three times—first, using 14 x 17 in. x-ray film, second, 4 x 5 in. film, and, lastly, 35 mm. film. Details of this study are presented in a companion article, "Comparative Value of Roentgen-Photographic Methods."

As a result of this study, and with further experience in x-raying selectees at the induction stations in upstate New York, it is our considered opinion that the 4 x 5 in. films are a satisfactory medium for screening large groups of people. Their degree of accuracy is within acceptable limits and, considering all factors, they are as economical as any other method.

Having solved the problem of excessive cost of 14 x 17 in. x-ray films by using the fluorophotographic method with 4 x 5 in. films, at approximately one-tenth the cost for films of the former size, the next step was to include this method in our plans for a long-range program for tuberculosis control in these institutions. The plan includes two main subdivisions: (1) to deter-

mine the extent of the problem, and (2) to take the necessary steps for control.

In effecting this plan, the following steps are to be taken:

DETERMINATION OF THE EXTENT OF THE PROBLEM

a. X-ray examination of all inmates by wards and buildings—Where tuberculosis wards exist, the patients in such wards are to be examined first, inasmuch as experience in three institutions has revealed that as high as 50 per cent of inmates isolated in these wards may not have clinically significant tuberculosis.

b. X-ray examination of all employees.

ADOPTION OF MEASURES NECESSARY FOR CONTROL

a. Segregation of all inmates with tuberculosis in tuberculosis wards—Where no tuberculosis wards exist, necessary provisions will have to be made to segregate cases found to have active lesions. Facilities for segregation are now available in all but six of the institutions.

b. Thorough study of employees with x-ray evidence of tuberculosis to determine their clinical status—To this end, admission to state or county tuberculosis hospitals may be necessary.

c. Examination of all new admissions by means of x-ray alone or by means of tuberculin test, followed by X-ray of positive reactors.

d. Preemployment x-ray examination of all new employees.

e. X-ray examination every 6 months of employees giving direct service to inmates, and every 3 months of employees in tuberculosis wards.

f. Active consultation service between the medical staffs of the Division of Tuberculosis and the hospitals regarding all phases of the control and treatment program.

g. X-ray reexamination study of the inmate population at the end of 1 year to determine future needs.

h. Establishment of a system of records which will provide necessary clinical, epidemiological, and statistical data.

i. Establishment of necessary prophylactic procedures, and the institution of an educational program on prophylaxis and prevention of tuberculosis for all nurses, attendants, ward workers, and others closely associated with the inmates, particularly those in the tuberculosis wards.

The New York State Legislature has appropriated \$45,000 with which to start this program July 1, 1941. A budget has been prepared which will provide 3 physicians, 1 of whom will direct the project, 2 x-ray technicians, 2 complete x-ray units capable of producing 4 x 5 in. films, a sufficient amount of such films and chemicals to x-ray between 45,000 and 50,000 individuals the first year, and a sufficient number of 14 x 17 in. films, with chemicals, to provide further detailed study of those individuals who show lesions on the small films. In addition, the budget also provides for traveling expenses, installation of alternating current where none exists, and other unforeseen contingencies.

It is obvious that the first year or two of the program will be taken up with determining precisely what the problem is, and that satisfactory control will not function until this question is answered. Nevertheless, control measures will be introduced as cases are found, and will go hand in hand with case finding.

Comparative Value of Roentgen-Photographic Methods

ROBERT E. PLUNKETT, M.D., GEORGE W. WEBER, M.D., AND
JULIUS KATZ, M.D.

Division of Tuberculosis, New York State Department of Health, Albany, N. Y.

MOST public health officials and physicians engaged in tuberculosis work are aware of the need for more intensive tuberculosis case finding through the use of the x-ray. Except in a few communities, workers in this field have not been able to do more than scratch the surface of this important problem.

Probably no single factor has retarded progress in extending tuberculosis case finding facilities to larger groups of the population more than has the cost of x-ray films.

Recent developments in photography of the fluorescent screen by the use of either the 35 mm. film or the 4 x 5 in. film have opened new channels of opportunity for more extensive and progressive case finding on an accurate, practical, and economical basis.

Although it is obvious from available reports¹⁻⁹ that either of these methods would effect a real economy, there are no conclusive data available that would indicate which is the more satisfactory in x-raying large groups of persons. It was decided, therefore, to conduct a study to determine: (a) technical factors in making exposures and processing small size films, (b) the relative ease and dependability of interpretation of small films, as compared with standard 14 x 17 in. films.

Inasmuch as the members of our

staff had never used either of these small film methods, the Westinghouse and the General Electric Corporations were invited to participate in a study of 1,000 persons. Each company was requested to furnish the x-ray equipment, films, and personnel, and to assume full responsibility for producing a processed film for interpretation. It was agreed that Westinghouse would use 35 mm. films and General Electric 4 x 5 in. films. Our own staff would assume responsibility for the 14 x 17 in. films.

With the advice and assistance of Dr. William J. Tiffany, Commissioner of the Department of Mental Hygiene, and Dr. William C. Garvin, Superintendent of Binghamton State Hospital, this institution was selected for the study because we could expect to find there a higher percentage of tuberculosis than in the average population. Realizing that the patients in such a hospital are not as coöperative as normal people, we assumed that any method which could be adapted to the x-ray examination of such patients would be found to be even more satisfactory for the x-raying of normal people.

Accordingly, the Westinghouse X-ray Corporation installed, and its technicians operated, a condenser discharge apparatus having a capacitance of one-half microfarad and a voltage range up

to and including 100 kv.p. The size of the focal spot of their tube was approximately 3 mm. This equipment was used with a roentgen-photographic unit for producing 35 mm. images of the fluoroscopic screen. The distance employed was 40 inches, and the exposure time was approximately 1/15 second.

The General Electric X-ray Corporation installed, and its technicians operated, a so-called conventional type, 200 ma. machine using a tube having an effective focal spot of approximately 4.5 mm. This was used with a roentgen-photographic unit to produce 4 x 5 in. films. The distance used was 40 inches, and the exposure time was 2/10 second.

For the 14 x 17 in. films we used 500 ma. equipment employing a rotating-anode tube having an effective focal spot of 2 mm. The distance used was 72 inches, and the time was 1/30 second.

It is obvious that any advantage to be gained from the standpoint of the best diagnostic technic was distinctly in favor of the 14 x 17 in. film, not only because of its size but also because of the shorter exposure time.

The patients were x-rayed by all three methods successively, being routed

first to the 35 mm. unit, then to the 4 x 5 in. unit, and finally to the 14 x 17 in. machine. They were x-rayed by all three methods at the rate of about 40 per hour, or a total of about 250 per day.

The 35 mm. films were read by projection on a screen with enlargement to about 6 x 6 in. and also by transmitted light with about two times magnification. The 4 x 5 in. films were read by transmitted light, without magnification.

The films were interpreted by the staff of the division, each member reading the films without any consultation with the others. The two sets of small films were read first to avoid the carrying over of any impressions regarding individual cases from the more accurate 14 x 17 in. films. When the readings of the small films were completed, those regarding which a difference of opinion existed were reviewed and the final diagnosis transferred to a single list which was used for comparison with the 14 x 17 in. films. After the 14 x 17 in. films were read by the staff members separately, they were reviewed at a consultation of all the members, and the final diagnoses determined at that conference were used as the standards by which the other films were judged.

TABLE 1

Comparison of Findings of 14 x 17 in. with 4 x 5 in. and 35 mm. Films

Clinically Significant Tuberculosis *	14 x 17 in.	4 x 5 in.			35 mm.		
	975 Films Inter- preted	945 Films Interpreted			614 Films Interpreted		
		Correctly Diagnosed	Not Diagnosed	Films Missing or Spoiled	Correctly Diagnosed	Not Diagnosed	Films Missing or Spoiled
Minimal	30	28	1	1	19	4	7
Moderately advanced	20	19	0	1	14	0	6
Far advanced	12	12	0	0	12	0	0
Total	62	59	1	2	45	4	13
Healed, Reinfection *	64	62	3	3	32	17	19
Surgical Les. *	9	8	2	1	4	2	3
Calcium	172	159	49	3	34	77	64
Elective	10	8	2	0	6	2	2
Non-tuberculous Pulm. Path. *	22	20	2	0	11	5	6
Cardiovascular	17	17	3	4	7	5	17
Arteriosclerotic Muc.	24	16	5	0	6	11	4

* The diagnoses on the small films were considered correct if they were called any one of this group.

In examining the small films, an attempt was made to establish a definite diagnosis in each case. However, in the analysis of the findings it was decided that, since the purpose of the small films is to screen out those patients who require full size films for further study, the criteria used in the classification of these cases must be quite liberal. This reasoning is also used in the paper of Douglas and Birkelo. If, for instance, a lesion was classified as healed reinfection in the 4 x 5 in. film, suspicious in the 35 mm., and proved to be a minimal, clinically significant lesion in the 14 x 17 in. film, it was felt that a correct diagnosis had been made on both small films. The same principle was applied to other types of pathology (Table 1).

14 X 17 IN. FILMS

A total of 975 14 x 17 in. films were interpreted, 14 were missing, and 11 were technically unsatisfactory. The number of cases of clinically significant pulmonary tuberculosis diagnosed was 62, or 6.4 per cent. Thirty (48.4 per cent) of the cases were minimal, 20 (32.3 per cent) moderately advanced, and 12 (19.4 per cent) far advanced. In addition, 68 cases were diagnosed as healed reinfection type tuberculosis, and 9 as suspicious, requiring further study for a more definite diagnosis.

4 X 5 IN. FILMS

Sixteen films were missing and 40 were technically unsatisfactory, so that only 944 were compared with the corresponding 14 x 17 in. films. None of the moderately advanced or far advanced cases of clinically significant tuberculosis were missed. Two of the minimal lesions were called negative on the 4 x 5 in. films. In one of these cases, however, the lesion was very small and was located behind a rib on the small film, while on the 14 x 17 in. film it was projected into the interspace.

This problem of the superimposition of pathologic lesions by more opaque anatomical structures is inherent in all flat x-rays of the chest, regardless of the size of the film, so that the failure to make a correct diagnosis on this film should not be considered a deficiency of the diagnostic value of the small films. In fact, the lesion was hidden from view behind a rib in 2 of 4 large films made subsequently of this same patient. Douglas and Birkelo have had the same experience of missing small lesions due to overlying denser structures. The other lesion not diagnosed in the small film was of moderate density, not sharply defined, and located in the periphery of the lung. It is of a type which would probably be missed frequently by the small films.

Exclusive of the first case, therefore, which might have been missed on any flat film, 1 case of minimal tuberculosis was not diagnosed, principally because of the size of the film, an incidence of 3.4 per cent of the minimal lesions, or 1.7 per cent of all cases of tuberculosis.

In the healed reinfection group, 3, or 4.6 per cent, of the possible 65 cases were not recognized.

The 4 x 5 in. films are less accurate in recognizing intrathoracic conditions other than the two mentioned above. Twenty-one per cent of the 248 cases showing calcium, thickened pleura, non-tuberculous pulmonary pathology, cardiac lesions, and anomalous conditions in the 14 x 17 in. films were not diagnosed in the 4 x 5 in. films.

On the other hand, 22 of the 14 x 17 in. films did not reveal any evidence of pathology, whereas their respective 4 x 5 in. films were interpreted as follows: 1 clinically significant tuberculosis; 2 healed reinfection tuberculosis; 19 suspicious pulmonary changes.

35 MM. FILMS

Unfortunately for the purposes of this study, considerable technical difficulty

was encountered in the operation of the 35 mm. x-ray unit, and as a result, only 614 such films were available for comparison with the corresponding 14 x 17 in. films.

None of the advanced and moderately advanced cases were missed, but of the 23 minimal lesions present in the corresponding 614 large films, 4 were not diagnosed on the 35 mm. films. There was, therefore, an error of 17.4 per cent among the minimal cases, or 8.2 per cent of all cases of tuberculosis.

In the healed reinfection group, the 35 mm. films were also less accurate than the 4 x 5 in. films, with 17, or 35 per cent, undiagnosed cases, as compared to 4.6 per cent in the latter.

The percentage of error in the group with non-tuberculous intrathoracic lesions was also considerably greater in these films than in the 4 x 5 in., 58 per cent of the possible 160 cases presenting these lesions in the 14 x 17 in. films having been undiagnosed on the 35 mm. films.

Diagnoses were made of clinically significant tuberculosis in 2 cases, of healed reinfection in 20 cases, and of non-tuberculous pulmonary pathology in 6 cases which were not confirmed by the 14 x 17 in. films. Also, 43 other patients were diagnosed as having suspicious pulmonary changes which did not appear in the 14 x 17 in. films.

A factor of considerable importance which is not brought out in the reports of surveys with small films is the extreme fatigue of the roentgenologist following the reading of even a small number of these films. This is particularly true of the 35 mm. size: the glare of light is very tiring to the eyes, whether the films are examined by transmitted or by reflected light. Not more than about 100 films could be read consecutively by any one individual at one time, nor could more than from 300 to 400 films be read during any one day, without developing considerable eye-

strain. In this, our experience is very different from those observers who claim to have been able to read 1,000 films in a 3 hour period.⁷ Unquestionably improvement in the devices for reading the films comfortably will be followed by increased accuracy of diagnosis.

Since the main reason for the use of small films is the economic one, it is important to determine the final net cost of film for each case of clinically significant tuberculosis found by each method. The personnel required for each method being comparable, and without accounting for the original cost of equipment, the average cost of a completely processed 14 x 17 in. film is 65 cents, while that of the 4 x 5 in. film has been estimated at 6 cents, and that of the 35 mm. film at 3 cents. On this basis, and taking into account the number of retakes with 14 x 17 in. films necessary in each group, the net cost of films for each tuberculosis case found in this study would have been \$10.22 if 14 x 17 in. films alone had been used; \$2.08 if 35 mm. films, and \$1.85 if 4 x 5 in. films had been used, as shown in Table 2. It will thus be seen that, from the purely financial point of view, little difference exists between the small size films, although the 35 mm. film appears to be slightly more expensive than the 4 x 5 in. This is due to the fact that the smaller the size of the films, the more difficult appeared their interpretation, and consequently the greater was the number of retakes with 14 x 17 in. films necessary to arrive at a definite diagnosis. In our case, for instance, 71, or 11.6 per cent, of the 35 mm. films required retakes on 14 x 17 in. films, as compared to 22, or 2.3 per cent, of the 4 x 5 in. films.

After due consideration of all the factors involved in mass tuberculosis surveys, we are led to the conclusion that, while both fluorophotographic methods are relatively adequate for the purpose,

TABLE 2
Relative Costs of 4 x 5 in., 35 mm., and 14 x 17 in. Films

<i>4 x 5 in. Films</i>			
944 satisfactory films	@ .06	\$ 56.64	
59 retakes on 14 x 17 in. films for confirmatory diagnosis.....	@ .65	38.35	
22 retakes on 14 x 17 in. films of cases incorrectly diagnosed pathological.....	@ .65	14.30	
Total cost of films		\$109.29	
Total cost of films per case found.....		1.85	
<i>35 mm. Films</i>			
614 satisfactory films	@ .03	\$ 18.42	
45 retakes on 14 x 17 in. films for confirmatory diagnosis.....	@ .65	29.25	
71 retakes on 14 x 17 in. films of cases incorrectly diagnosed pathological.....	@ .65	46.15	
Total cost of films.		\$ 93.82	
Total cost of films per case found.....		2.08	
<i>14 x 17 in. Films</i>			
975 satisfactory films	@ .65	\$633.75	
Total cost of films per case found.....		10.22	

the 4 x 5 in. films are preferable because of their greater accuracy in the diagnosis of clinically significant tuberculosis, the greater ease with which these films can be read, and the cost.

The results of this study show that by using the 4 x 5 in. film, 98.3 per cent of all cases of clinically significant tuberculosis would have been found, while by using the 35 mm., only 91.8 per cent of the cases would have been diagnosed. In the case of minimal lesions, the 4 x 5 in. films were accurate in 96.6 per cent, and the 35 mm. in 82.6 per cent. Both were 100 per cent accurate in diagnosing moderately advanced and far advanced cases. Since this study has been completed, we have had an opportunity to review some 4 x 5 in. stereoscopic films. The quality of these films should enhance the value of small films for screening

without appreciably increasing the cost. We have been informed that technics to provide 35 mm. stereoscopic films have also been developed.

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Epidemiology of Poliomyelitis in Detroit in 1939^{*}

FRANKLIN H. TOP, M.D., F.A.P.H.A., AND
HENRY F. VAUGHAN, Dr.P.H., F.A.P.H.A.

*Director, Communicable Diseases and Epidemiology, Department of Health,
Detroit, Mich.; and School of Public Health, University of
Michigan, Ann Arbor, Mich.†*

POLIOMYELITIS has occurred in sizeable outbreaks in this country since 1916, the first large epidemic having occurred in New York State in that year. Prior to this and since, large outbreaks have occurred in foreign countries, notably in the Scandinavian countries, Germany, Australia, New Zealand, and Canada. Many of the outbreaks have been studied quite exhaustively from an epidemiological standpoint. Aside from the more routine epidemiological information available for most communicable diseases, evidence as to the portal of entry, mode of transfer, and spread has been meager and inconclusive; actually, very little is known concerning the epidemiology of poliomyelitis. During 1939, 521 poliomyelitis cases with 23 deaths were reported in Detroit, the largest outbreak in the experience of this city. This paper deals with a few of the epidemiological findings which grew out of the field studies carried on during the duration of the outbreak.

Prior to July, 2 cases were reported, one in May and the other in June. By the middle of July 7 cases had been

notified, but it was not until July 25 that we realized the attack rate would probably be high and that the disease was becoming prevalent in Detroit earlier in the summer than heretofore. The Department of Health planned administrative procedures to deal with a major outbreak, took measures to keep the public informed of the prevalence of the disease, and gave advice relative to control procedures. The coöperation of the medical profession was sought in order to secure the prompt reporting of cases and suspicious cases and to inform physicians concerning currently accepted practices. A more intensive study of reported cases and their relationship to possible modes of transmission was instituted.

Through the courtesy of Surgeon General Parran and Medical Director Leake of the U. S. Public Health Service, Dr. Alexander Gilliam was sent to Detroit directly from the experience of poliomyelitis in Charleston, S. C. Dr. Gilliam and members of the executive staff of the department drafted an epidemiological form patterned after that used in the Charleston outbreak. It was felt that no field epidemiological study should be made without using controls.

NOTE: This study was aided by a grant of the National Foundation for Infantic Paralysis, Inc.

^{*}Read at the Joint Session of the Laboratory and Epidemiology Sections of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

[†]Formerly Commissioner of Health, Detroit, Mich.

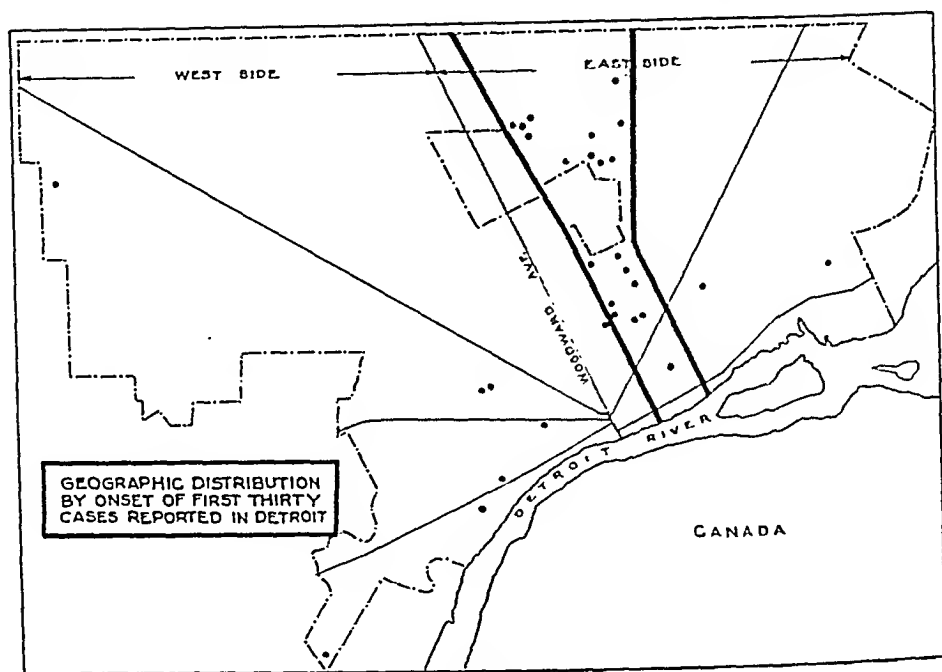


CHART III

was not significant; the peak was reached in mid-August. The disease was again prevalent in 1931 but the peak did not occur until the second week in September. Less noteworthy increases in the disease occurred in 1935 and 1937, with a majority of the cases found in late August or early September. The outbreak in 1939 furnished by far the largest number of reported cases, and the peak occurred earlier in the summer season. It should be noted that in the 1939 outbreak slightly over 55 per cent of cases were paralytic, probably indicating better reporting. The mobilization of medical resources to deal with infantile paralysis in 1939 unquestionably resulted in more clinical cases being brought to light. The diagnosis was based upon clinical and laboratory findings, verified for the most part by diagnosticians of the Department of Health.

Previous Ontario Experience—In the summer of 1937 poliomyelitis was prevalent in eastern Ontario, the attack rate in Toronto being approximately 100 cases per 100,000 population. At that

time a few cases were reported in the Windsor area across the river from Detroit but not in Sarnia, opposite Port Huron (Chart II). In 1938, according to information furnished by Dr. John T. Phair, Medical Officer of Health for Ontario, the disease was prevalent in and around Fort Williams and Port Arthur, situated in western Ontario on the north shore of Lake Superior. Early in the summer of 1939, poliomyelitis became prevalent in Sarnia, and a significant number of cases was reported in and near that city approximately 6 weeks before the first cases began to appear in Detroit. We were informed by the Canadian authorities that prior to July 20, 1939, approximately 20 diagnosed cases with 4 deaths had been reported from the Sarnia area.

Possible Relation of the Detroit Epidemic to the Ontario Outbreak—Chart III shows the geographic distribution (by onset) of the first 30 cases reported in Detroit. We were impressed by the fact that of these 30 cases, 21 were reported from the funnel-shaped area on the nearest side of the city. This

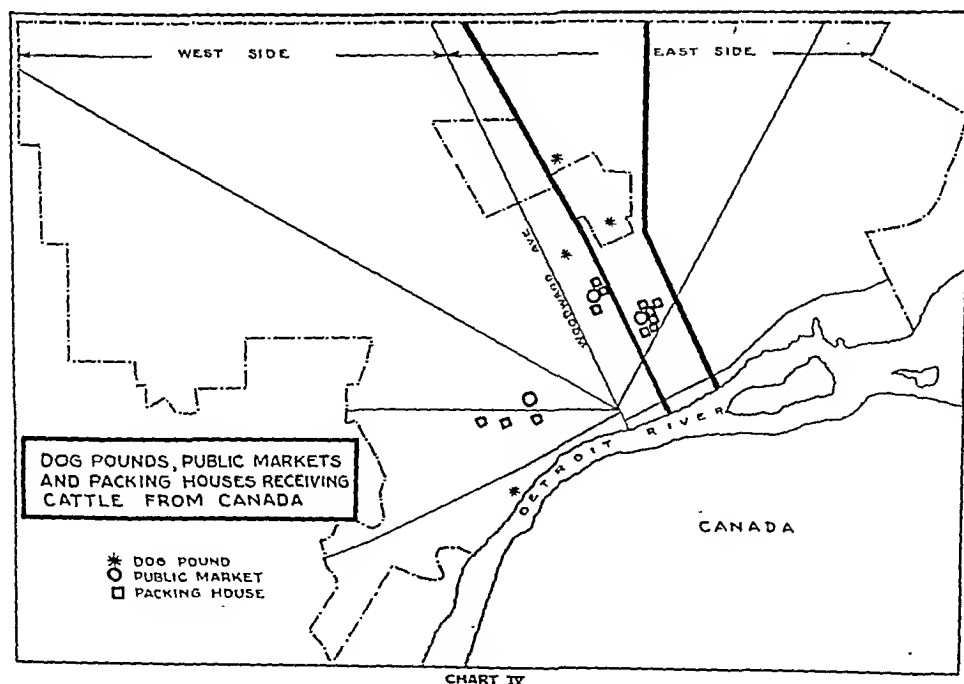
was impressively different from the geographic distribution of our previous outbreaks. During the past several years poliomyelitis had been reported in greater numbers on the west side of the city and in 1939 the opposite was true.

With the data on Chart III before us and with candor as to the possible source of infection, we began to investigate the likelihood of the disease having been imported from the Sarnia area, either via Port Huron or Windsor. In the neareast side of Detroit there are located two important public markets and several packinghouses (Chart IV). On the west side there are a public market and a number of large packinghouses. In the east side area there are three dog pounds at which unclaimed animals are destroyed, collected, and disposed of at rendering plants located on the west side of the city. The largest dog pound in the city is that operated by the Police Department and located on the west side.

We thought it worth while to examine the possibility of an animal reservoir

which might have brought the infection in from Canada and from which an insect vector might have spread the infection in the neareast side. The highways by which cattle are brought to the packinghouses and the main artery of the Grand Trunk Railroad all lie in this neareast side area. One branch of the Grand Trunk Railroad comes directly from the Port Huron and Sarnia area.

Complete records are kept by the United States Government of all cattle, horses, sheep, poultry, and other animals brought in at Port Huron or Detroit. We traced from government records, at point of shipment in Canada to place of final disposition in Detroit, 4,248 head of cattle transported across the border during the months April to July inclusive, and found that 1,964 head of cattle went to packinghouses in the neareast side area while 2,284 went to the west side of the city, where but few of the early cases of poliomyelitis occurred. Inquiry at the packinghouses, where the Health Department maintains



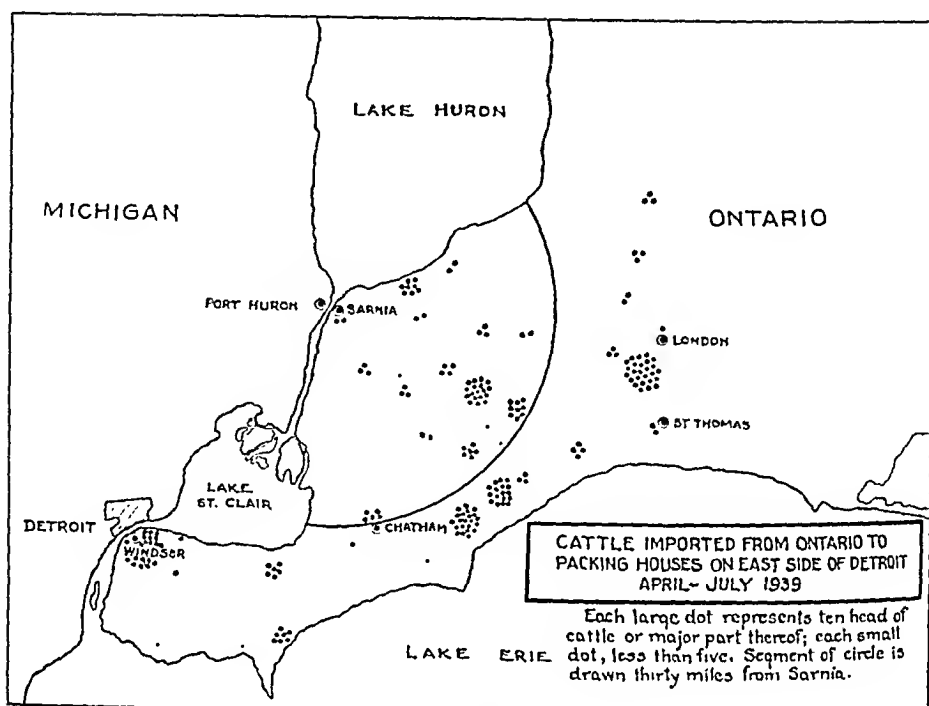


CHART V

veterinarians for post-mortem inspection, indicated no evidence of animal paralysis.

The shipment of animals from Canada to Detroit was relatively heavy in April and July, less in May, and virtually nil during the month of June. Of 1,964 animals imported from Canada which went to the east side, 563 came in April, 386 in May, only 6 in June, and 1,009 in July (Chart V). There is evidence that the outbreak in Ontario was well under way in June.

There were 9 animal shipping points in Canada within 30 miles of Sarnia from which, during the 4 months April to July inclusive, 2,266 head of cattle were shipped to Detroit. Of this number only 525 went to the east side packinghouses while 1,741 went to west side establishments.

During the months April and May, 978 head of cattle were sent to Detroit from 8 communities within 30 miles of Sarnia, and of these 787 went to the west side and only 191 to the east side.

There seems to be nothing significant from these data which could justify the conclusion that cattle served as a reservoir of infection and were a factor in the transmission of the disease to Detroit from the Sarnia area. Twenty head of cattle were shipped from Sarnia and 45 from Camalachie, a nearby town, to the east side of Detroit during the months April and May. During the same two months, however, Sarnia shipped 25 head to the west side and Camalachie shipped 159 head. There is the chance that one or more of the animals from this area sent to the east side may have been infected, but the possibility is extremely remote. Only concurrent laboratory studies could have provided a final answer. There was no opportunity to examine stools from these animals nor to study the possible infection of flies which accompany such animal shipments.

Cattle, sheep, and horses shipped from Canada to other destinations in the United States were likewise studied,

and we found no evidence that animals were shipped from the Sarnia area to communities in the United States where poliomyelitis was significantly present during the summer of 1939.

The first cases in Sarnia gave a history of onset within a few weeks after the opening of navigation on the Great Lakes.¹ Sarnia is the most important shipping point on the lower Ontario peninsula for produce sent to Port Arthur. It is significant that the principal travel between these two ports is by water; there is no through highway around Georgian Bay and the north shore of Lake Superior. Land and railroad travel from Sarnia to Port Arthur is via Toronto. Direct communication between Port Arthur and Sarnia is established only after the opening of navigation which is usually in May. Travel between Sarnia and the Detroit area is considerable during the late spring and summer. Many Detroiters have their summer homes on the east shore of Lake Huron above Sarnia and for the most part travel via automobile, crossing the border at the Blue Water Bridge between Port Huron and the Canadian shore. The possibility of the transmission of infection by person-to-person contact via the navigation route with a possible reservoir of infection in Port Arthur during the winter months is suggested. We admit, however, complete uncertainty as to the manner in which the infection may have been brought into Detroit. Epidemiological studies show that some of the first Detroit cases (by onset) had been visiting friends and relatives in the Sarnia area.

FIRST CASES IN DETROIT

Chart III shows the unusual prevalence of the first 30 cases in a funnel-shaped area on the neareast side of Detroit. Nine cases were reported from the more congested Eastern Market and packinghouse districts. This section of

the city is heavily populated. It is significant that 11 of the early cases were reported from the "Special District," an area north of the city of Hamtramck, where the population is less dense, but where growth has been extensive since 1930. Until the data for the 1940 census become available, no estimate can be made of the attack rate in this or other districts. Our impression from a knowledge of the area and density of population is that the attack rate in the "Special District" was higher than elsewhere in the city.

Of the first 62 cases by onset in Detroit (prior to July 24) 45 were reported from the east side and 17 from the west side of the city. Again, of the 45 east side cases 19 were reported from the "Special District."

Mindful of the possibility of an animal reservoir, a survey was made, with the coöperation of 70 veterinarians in private practice, of all privately owned and public dog kennels to ascertain whether there had been any increase in canine paralysis. There was no evidence of any increase in paralysis above what is commonly to be anticipated at this time of the year. The lack of laboratory facilities did not permit of more conclusive studies based upon autopsies of dogs, examination of canine stools, investigation of insects associated with dogs, and other factors.

CLASSIFICATION OF SOURCE OF INFECTION

Epidemiological case histories were obtained by 50 public health nurses who received special training and instruction for this purpose. Many hours were consumed in careful planning of the work before the nurses were sent into the field and the data were concurrently reviewed, studied, and roughly classified by epidemiologists. As the Detroit regulations for the control of poliomyelitis provided for holding exposed children (through

high school age) under a warning sign for 14 days following last exposure, and as families living in the area where poliomyelitis was prevalent became familiar with those regulations, there was undoubtedly a tendency for many families to cover up valuable information concerning possible contact with a case or suspicious case. The same nurses who filled out the epidemiological forms were charged with supervision of quarantine and isolation. It would seem reasonable that where evidence of personal contact was found between cases, the very minimum of such contact was recorded. Had isolation restrictions been less severe, we might have been more successful in securing an insight into the movements and life habits of families. During the hot summer months no family desires to have one or more children under a warning sign, deprived of association with playmates, and denied the company of the family when off the premises.

In spite of this limitation some degree of success was obtained in discovering sources of infection. The following classifications were employed:

1. Cases for which there was no definitely ascribable suspected source. Epidemiological case records, which were reviewed by an epidemiologist, revealed no admitted contact with a case of poliomyelitis or an illness suspicious of poliomyelitis during an interval which would warrant a definite conclusion as to source of infection. The interval of probable infectiousness, namely, that period from date of last exposure to a diagnosed case to the onset of a subsequent case, was arbitrarily set at 4 to 14 days inclusive. If two cases appeared in the same household or child contact group and the interval was less than 4 days, we concluded that there was probably a common source of infection. The limits of the incubation period for poliomyelitis remain indefinite, but for the purpose of this study the period 4 to 14 days was chosen and uniformly used.

2. Cases in which there was direct contact at the proper time with a diagnosed case of poliomyelitis.

3. Cases in which there was reasonable evidence of suspicious direct contact with a known case.

4. Cases in which direct contact with a known carrier of poliomyelitis occurred. This happened in a single instance. A child was exposed to a proven carrier at a children's institution and the virus was recovered from the stools of the carrier.

5. Cases which were in direct contact with a suspicious case of poliomyelitis. The suspicious cases were officially held under quarantine by the Department of Health as such, pending a final diagnosis, but were finally not called cases, although it is likely that many of them were clinically abortive in type.

6. Cases for which there was evidence of direct contact to a suspected carrier or missed case—such carriers or missed cases, of course, were not and could not be proved except by laboratory procedure.

7. Cases with proper exposure to a familial or extrafamilial illness, the symptoms of which were compatible with the first phase of poliomyelitis but lacked clinical evidence of central nervous system involvement.

8. Cases which by date of onset could be classified as having definitely contracted the disease outside of Detroit.

9. Cases in which the evidence was such that the case probably contracted the infection outside the city of Detroit.

10. Cases in which reallocation was officially made by the Michigan Department of Health to an outside community. Reallocations are officially made by the State Health Department only for communities within Michigan. In instances where the source of infection could be definitely ascribed to a sojourn in Canada the classification "outside" was used (No. 8).

Based upon this rough classification, Table 1 was prepared, showing the source of infection by onset in May-June, July, August, September, and subsequent to September.

In the series of 521 cases, 364 were classified in the group with an unknown source of infection (No. 1). This represents 69.9 per cent of all cases. Sixty-one, or 11.7 per cent, were classified as having had direct or suspicious direct contact with a reported case, or direct contact to a proven carrier (Nos. 2, 3, 4). In 70 cases, or 13.4 per cent

TABLE 1
Poliomyelitis in Detroit, 1939
Source of Infection by Month

Source of Infection	Month					Totals
	May-June	July	Aug.	Sept.	Oct.-Dec.	
1. Unknown	6	73	163	92	30	364
2. Direct contact	0	12	19	14	4	49
3. Susp. dir. cont.	0	4	3	4	0	11
4. Dir. cont. to carrier	0	0	1	0	0	1
5. Dir. cont. to susp. case	0	3	0	0	0	3
6. Susp. indirec. cont.	0	1	2	0	0	3
7. Exposure to illness	0	6	43	18	3	70
8. Outside	0	0	2	2	1	5
9. Probable outside	1	4	9	1	0	15
10. Reallocated *	0	3	2	2	0	7
Totals	7	103	242	131	38	521

* Reallocated cases are *not* included in the totals

of the total, there was a history of exposure to an illness suggestive of the symptoms of the first phase of poliomyelitis (No. 7). In 20 instances, or 3.8 per cent, the source of infection was either known or reasonably suspected of being outside of the City of Detroit (Nos. 8, 9).

We were especially interested in the 56 cases which resided in the "Special District" as it was here that many of the first cases by onset occurred and it was here that the attack rate was the highest.

POLIOMYELITIS IN THE "SPECIAL DISTRICT"

The funnel-shaped area previously described was called the epidemic area. The northern portion of the epidemic area was designated the "Special District," and here occurred a large proportion of the first cases reported in

the city. A total of 56 cases was reported in the district. The cases by week of onset are shown in Chart VI. In 20, or 35.7 per cent of instances, a probable source of infection was found. Dividing the 56 cases by time of onset into two groups, those with onset prior to August 15, of which there were 40, and those with onset subsequent to August 15, of which there were 16, we find a strong argument for the need of making a good epidemiological investigation before the disease has become generally disseminated throughout the community. Of the first 40 cases in this "Special District" (reported prior to August 15) a definitely classified probable source of infection was found in 18 cases, or 45 per cent of the total. Of these 18, 13 were considered as being in direct contact or there was evidence of suspicious direct contact (by history) with other cases. These 13

cases represent 32.5 per cent of the first 40 cases in the area.

While a definitely classified source of infection was found for 18 of the first 40 cases, such source of infection was found only in 2 instances for the last 16 cases reported (subsequent to August 15). While 13 of the first group (40) of cases could be ascribed to a direct or a suspicious direct contact, only one of the last 16 cases was so classified.

In the "Special District" there were 12 children who gave a history of playing on the White School playground. Histories obtained from families showed that there had been direct contact between 5 cases which played at the White School and cases of poliomyelitis with onset at the proper time. In addition to these 5 cases there were 2 others which gave a history indicating suspicious direct contact and 1 with suspicious indirect contact. This leaves 4 cases in which there is a definite history of the children playing at the White School grounds but no admitted personal contact with children who developed infantile paralysis. Therefore, we have classified these 4 cases with those for which there was no satisfactory evidence

of source of infection. It is reasonable to consider that contact did exist on the playground although no admission of such contact was made by the parents or children.

EPIDEMIOLOGICAL FACTORS STUDIED

The epidemiological form used in this study allowed for the collection of an extensive amount of information for each case and control. Numerous factors which might influence the occurrence of poliomyelitis were studied. These included, besides data covering onset, age, sex, and color, the following: interval between onset and report of a case, stress or illness, previous inoculation against other communicable diseases, previous history of other communicable diseases, preventive measures taken by the family, places visited by the patient within one month of onset of illness, the number of familial and extrafamilial contacts, economic status of the family, the number of rooms per family, sleeping accommodations, the number of pets (dogs, cats, birds) in the household and in the neighborhood; reliability of information; tonsillectomy and adenoidectomy within one year and more than one year before, among others.

CHART VI—Poliomyelitis in Special District by Week of Onset and Source of Infection

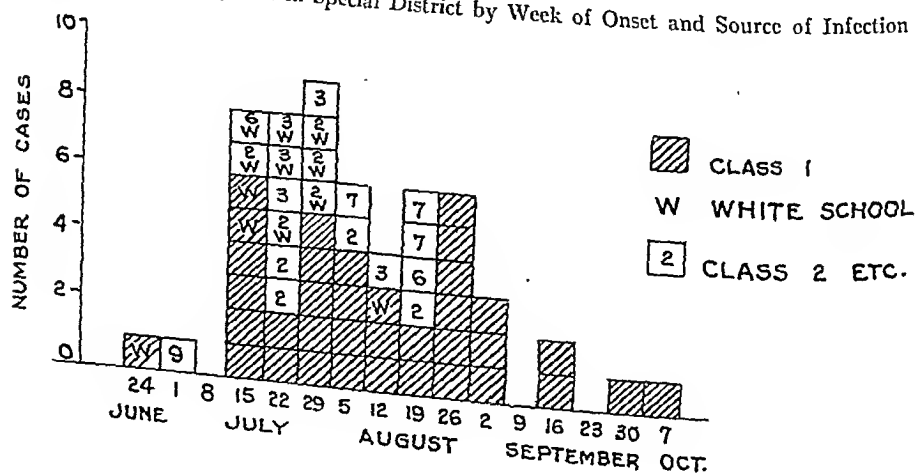


TABLE 2

*Poliomyelitis in Detroit, 1939**Cases, Deaths, and Controls by History of Stress or Illness Within 4 to 14 Days of the Onset of Poliomyelitis*

	Total	Stress or Illness		No Stress or Illness	
		Number	Per cent	Number	Per cent
All cases	521	106	20.3	415	79.7
Deaths	23	8	34.8	15	65.2
Case controls	497	27	5.4	470	94.6
Spec. Dist. controls	129	7	5.4	122	94.6
West Side controls	167	15	9.0	152	91.0
Child. inst. controls	141	8	5.7	133	94.3

Analysis of the various factors studied revealed negative information on all save stress and tonsillectomy and adenoidectomy.

Both the clinician and epidemiologist have noted the frequency of a history of stress or strain prior to the onset of poliomyelitis. This factor was studied with relation to the time of occurrence of stress or illness, its incidence with relation to clinical type, and the occurrence among cases, case controls, and the other control groups used in the study. The effect of stress on cases which died or recovered and on control groups is shown in Table 2. Here it will be noted that in 34.8 per cent of the patients who died there was a history of stress or previous illness, whereas all patients, whether they had paralysis or not, gave a history of stress or illness prior to onset in 20.3 per cent of instances. A history of stress or illness among case controls was obtained

in only 5.4 per cent, and for the remaining three control groups it varied between 5.4 and 9.0. Too much emphasis should not be placed upon data of this type, for there are evident weaknesses in history of illness obtained by questioning. Parents of a patient ill with poliomyelitis are far more likely to recall an illness or injury just prior to the onset of the disease than are parents of children used as controls.

The question of the effect of tonsillectomy directly preceding the onset of poliomyelitis has been commented upon by numerous authors, the earliest mention being made by Ayer,² and Aycok and Luther,³ and reviewed and added to most recently by Stillerman and Fischer.⁴ Various factors were studied with relation to tonsillectomy, namely, the clinical type of poliomyelitis, age, sex, and the period of time tonsillectomy was performed prior to the onset of poliomyelitis. In Table 3

TABLE 3

*Poliomyelitis in Detroit, 1939**Cases, Deaths, and Controls by Tonsillectomy Status*

	Total	No Tonsillectomy		Tonsillectomy	
		Number	Per cent	Number	Per cent
All cases	521	306	58.7	215	41.3
Deaths	23	3	(13.0)	20	87.0
Case controls	497	364	73.2	133	26.7
Spec. Dist. controls	129	113	87.6	16	12.5
West Side controls	167	138	82.6	29	17.4
Child. inst. controls	141	89	63.1	52	36.9

the tonsillectomy status of cases, deaths, and controls is shown. We find that among the 23 deaths, 20, or 87 per cent, had a tonsillectomy at some time or other.

Among the 521 cases (including deaths) tonsillectomy had been performed in 41.3 per cent. With reference to the case controls, in 26.7 per cent the tonsils had been removed. Among the "Special District" and west side controls (children from geographic areas where the economic status was low), 12.5 and 17.4 per cent respectively of the group had tonsillectomies. The Children's Institution controls were from a district where the economic status is good, and among this group the tonsils were absent in 36.9 per cent. The proportion of persons who had tonsillectomy performed within one month of onset was as follows: deaths 5.0 per cent, cases 5.1 per cent, and case controls 7.5 per cent.

Previous studies have shown that persons who develop poliomyelitis within one month of tonsillectomy usually suffer from higher center paralysis. In this experience non-tonsillectomized patients developed bulbar paralysis in 4.2 per cent of cases while patients previously tonsillectomized, whether within one month, within one year or over a year of the onset of poliomyelitis, developed bulbar paralysis in 27 per cent of cases. Comment is deferred until such time as all tonsillectomy data obtained in this study can be presented in its entirety.

GROUPS OF SPECIAL INTEREST

Certain cases or groups of cases with special circumstances surrounding them appeared as likely subjects for detailed epidemiological and laboratory study. One such instance in the outbreak was the story of 5 cases which occurred in a children's home and which has been reported by Kramer, Gilliam, and Molner.⁵ In this institution in one

section of which were housed 20 infants and preschool children from 2 months to 5 years of age, there occurred 5 cases, 1 terminating fatally, the other 4 being nonparalytic cases. The children in this institution were under very excellent medical care, and routine records were kept of their health status including the recording of temperature twice daily. The virus of poliomyelitis was recovered from 3 of 12 healthy children, contacts to the cases, and from 2 of 3 children who had a fever of from one to two days' duration. The virus was also found in the stool of 1 healthy adult among 8 attendants who were in close contact with the children. We regret that laboratory facilities did not permit the application of this intensive study method to all interesting groups.

COMMENT

There are many cases of special interest which could have been mentioned. Would it not be desirable to study stools, nasal washings, bloods, spinal fluids, autopsy material from diagnosed cases, suspicious cases, illnesses with symptoms suggestive of the first phase of poliomyelitis, contacts and control groups, and tie all of these data in with a sound epidemiological study? In Detroit samples of sewage were analyzed and water obtained from wading pools and swimming pools was studied. Stools and excretions should be collected from cattle, sheep, horses, dogs, and other animals, as well as from birds and insects, and examined for the presence of poliomyelitis virus. To be effective, however, it is our judgment that the epidemiologist and virologist must be on the job early in the outbreak.

There is ample evidence in this study to indicate the need of making a good epidemiological investigation before the disease has become generally disseminated throughout the community. To attempt such a study three or four

weeks after a significant increase in the incidence of the disease would be less profitable.

It may be assumed for the sake of argument that with an increase in number of clinical cases there occurs an increase in carriers and missed cases, aiding chance and unrecognized contact with sources of infection. At the beginning of an outbreak the association between individuals, diagnosed cases, and possible foci of infection is more apparent due to the limited area in which the population has been attacked and possibly due to a more virulent virus as suggested by the high fatality rate reported at the beginning of poliomyelitis outbreaks.

In the study of outbreaks of poliomyelitis it has been repeatedly stated that rarely can a personal contact between cases be shown. The Detroit experience indicates that when a careful study is made of each case with a thorough examination of the life habits of the family, personal contact with previous or suspicious cases can be found in about one-third of the instances, providing such an intensive study is made near the beginning of an epidemic. We wonder if any better result could be shown for such a contact-borne disease as diphtheria, eliminating from consideration, of course, such outbreaks as might be due to milk or other food contamination!

During the course of an outbreak of poliomyelitis there are administrative and control practices which demand a great deal of the time of the health officer and his staff. As the number of reported cases grows it becomes increasingly more difficult to obtain epidemiological information within a short time following report of the case. It is impossible to spend the amount of time necessary to obtain the kind of information which might lead to clues. Added to this is the fact of multiple exposure, which makes the tracing of

the infection a difficult one. Whether laboratory facilities are available or not, better epidemiological investigation can be carried out in a community during an endemic prevalence than while an epidemic is in progress. We feel that the study of poliomyelitis under combined epidemiological and laboratory auspices is apt to be more productive if the community has been previously sampled over a period of several years, for the determination of the immunity status of children and adults, and the determination of the carrier rate. Thus a base-line can be established which would be of inestimable value when actual cases of poliomyelitis occur in the area at a later date. The study should be conducted in a small town or district where poliomyelitis has not occurred in epidemic form during the past 10 years. Such a study would entail the use of large numbers of animals and adequate laboratory facilities. At the present time the monkey is the only animal which is suitable for experimental studies. The cotton rat, reported as an experimental animal by Armstrong⁶ has not yet proved of value for all strains of poliomyelitis virus.

SUMMARY

1. The outstanding epidemiological features of the Detroit epidemic in 1939 have been presented although no detailed consideration has been given in this paper to the numerous factors studied.

2. Because of the geographic distribution of cases the Detroit experience presented an unusual opportunity to study the cases reported early in the outbreak. It is apparent that among the earlier cases a greater proportion were found to have direct contact with other known cases and that later in the epidemic this did not obtain.

3. Extensive epidemiological investigation of poliomyelitis cases may appear desirable. However, little knowledge has been added recently by this method of approach. A study of previously reported epidemics and the Detroit experience leads us to the conclusion that without laboratory facilities for following up important leads uncovered by the epidemiologist, further exhaustive field studies

are not likely to contribute much to the epidemiology of poliomyelitis.

4. We recognize that nothing has been added to a solution of the problem of portal of entry or the mode of transmission of this disease, but we offer the suggestion that epidemiological investigation must be coupled with laboratory studies as the hope of increasing our information concerning poliomyelitis. The finding of poliomyelitis virus in the stools of several apparently well children and in the stools of their attendant was the result of collaboration between the epidemiologist and the virologist.

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Distribution of the Vectors of Equine Encephalomyelitis in Massachusetts*

ROY F. FEEMSTER, M.D., DR.P.H., F.A.P.H.A., AND
VLADO A. GETTING, M.D., DR.P.H.

*Director, Division of Communicable Diseases; and Technical Director of
Mosquito Survey, Massachusetts Department of Public Health,
Boston, Mass.*

THE observation that human beings are susceptible to the virus of equine encephalomyelitis, first made in Massachusetts in 1938, brings to light another infection which must receive attention by public health workers. Undoubtedly human infections with this virus have been occurring previously but have been classed as diseases caused by other neurotropic agents. So far, the number of cases has not been large, but a virus which causes the death of three-quarters of those affected, produces profound cerebral changes in two-thirds of those surviving, allowing less than 10 per cent of those affected to return essentially to normal,^{1, 2} must be regarded seriously. The eastern virus, fortunately, is more limited in geographic distribution than the less virulent western virus.

ORGANIZATION OF MOSQUITO SURVEY

Following the 1938 outbreak in Massachusetts, a committee was called together by the Commissioner of Public Health, Dr. Paul J. Jakmauh, to consider measures which would give the

most hope of affecting the future trend of the disease. Since evidence points to the theory that *Aedes* mosquitoes are the principal vectors of the virus, this committee recommended as the most urgent need the collection of information in regard to the geographic distribution, seasonal prevalence, and the habits of the mosquitoes of the state. Upon the urgent request of the Commissioner, the Governor recommended to the legislature the appropriation of funds to sponsor a WPA project for the purpose of making a mosquito survey. With funds made available in this manner, the field work of the survey was carried out in the summer of 1939.

Since the collections were to be made by individuals with no previous knowledge of entomology, it was necessary to call 40 of the field workers into Boston for a week of training in the methods of recognizing mosquitoes and larvae, the methods of making collections, and the manner of recording information regarding breeding places. The content of this course of training was issued as a mimeographed bulletin for the benefit of those who may wish to organize similar surveys in the future. The instructors in the course were drawn from Harvard University and the

* Read at a Joint Session of the Laboratory and Epidemiology Sections of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

Massachusetts State Departments of Public Health and Agriculture.

Those who had received instruction in this training course returned to the various counties where they, in turn, trained additional workers in the methods of collection. At the peak, about 100 individuals were engaged in the field work and almost 50 others were employed in the central office and laboratory. In addition to personnel provided by the Work Projects Administration, a technical director and ten entomologists supervised the technical procedures used by the field workers, identified the specimens, and also made special field and laboratory investigations. Fortunately, well trained entomologists were available for these positions. Early in the survey, it became necessary to revise the identification key to the mosquitoes of New England which had been compiled by Tulloch in 1930.³ The new key was prepared and published by the same author,⁴ who was the chief entomologist in the survey, with the assistance of the other members of the technical staff.

Each of the 351 cities and towns in the state was visited weekly, five to ten points being covered at each visit. The collections were forwarded to the central laboratory in Boston at the end of each week. The combined data from the laboratory and the field were compiled

and summarized by the office group of WPA workers and recorded on maps and graphs which formed the content of a mimeographed report of the survey.

In addition to the specimens obtained by the regular collectors, many were sent in by volunteers recruited from a large group of official and nonofficial agencies throughout the state. The principal contribution of these volunteers was the gathering of nocturnal biting mosquitoes, as only diurnal biters were collected by the regular personnel.

The information obtained in the survey was quite voluminous. A report compiled by the technical director consisted of 450 typewritten pages, containing 50 charts, 55 maps, and 174 tables. Almost 50,000 separate collections were made, comprising over 275,000 specimens of mosquitoes and larvae. These were distributed among 51 species of 9 genera.

Of the total specimens, 91.4 per cent were larvae (Table 1), and only 8.6 per cent were adults. This distribution was due largely to the plan to base the survey upon collections of larvae, because of the information gained in regard to breeding places, and to the greater ease of their identification. The vicious biting habits of *Aedes* resulted in about half of the specimens of this genus being adults. Because of the difficulty in collecting *Mansonia* larvae,

TABLE 1
*Relative Importance of Different Genera Specimens of Adults and Larvae
Massachusetts, 1939*

Genus	Adults		Larvae		Total Specimens	Relative Importance: Per cent
	Number	Per cent	Number	Per cent		
<i>Aedes</i>	8,409	46.4	9,733	53.6	18,142	6.6
<i>Anopheles</i>	1,260	3.8	31,728	96.2	32,988	11.9
<i>Culex</i>	7,443	3.5	206,206	96.5	213,649	77.3
<i>Mansonia</i>	6,663	91.1	649	8.9	7,312	2.6
<i>Psorophora</i>	4	44.4	5	55.6	9	0.0
<i>Theobaldia</i>	90	4.3	2,004	95.7	2,094	0.8
<i>Uranotaenia</i>	14	0.6	2,312	99.4	2,326	0.8
<i>Wyomyia</i>	9	36.0	16	64.0	25	0.0
<i>Orthopodomyia</i>	0	0.0	3	100.0	3	0.0
	23,892	8.6	252,656	91.4	276,548	100.0

TABLE 2
Distribution of Genera by Counties
Combined Total Adults and Larvae
Massachusetts, 1939

County	<i>Aedes</i>	<i>Anopheles</i>	<i>Culex</i>	<i>Mansonia</i>	All Others	Total
Barnstable	6,635	368	23,548	3,286	1,286	35,123
Berkshire	465	3,919	21,814	76	139	26,413
Bristol	744	1,667	11,604	123	129	14,267
Dukes *	2,838	25	8,100	157	551	11,671
Essex	1,472	5,701	22,498	827	136	30,634
Franklin	483	2,512	10,176	19	14	13,204
Hampden	1,335	7,340	9,602	71	195	18,543
Hampshire	307	671	8,000	16	116	9,110
Middlesex	603	2,394	43,668	243	519	47,427
Norfolk	951	736	13,793	625	280	16,385
Plymouth	1,321	2,448	13,041	1,130	848	18,788
Suffolk	122	12	4,609	116	35	4,894
Worcester	866	5,195	23,196	623	209	30,089
Total	18,142	32,988	213,649	7,312	4,457	276,548

* Including Nantucket

which breathe from air cells of submerged plants instead of from the surface of the water, and because of the persistent biting habits of the adults, an even larger proportion of adults of this genus was collected (91.1 per cent).

It is encouraging to know that the

most frequently discovered genus was *Culex* (Table 1), no species of which has been incriminated so far as a vector of disease of man, in the latitude of Massachusetts. The next most common genus was *Anopheles*, but malaria is no longer endemic in the state. The genus

TABLE 3
Relative Numerical Importance of Various Species of *Aedes*
Massachusetts, 1939

	Adults	Larvae	Total	Per cent	Per cent Vectors *
<i>Aedes vexans</i> (EW)	1,065	3,359	4,424	25.1	25.1
<i>A. cantator</i> (EW)	1,326	2,643	3,969	22.5	22.5
<i>A. sollicitans</i> (EW)	2,541	1,048	3,589	20.4	20.4
<i>A. canadensis</i>	764	498	1,262	7.2	....
<i>A. atropalpus</i> (E)	184	871	1,055	6.0	6.0
<i>A. cinereus</i>	533	482	1,015	5.8	....
<i>A. aurifer</i>	540	...	540	3.1	....
<i>A. excrucians</i>	482	43	525	3.0	....
<i>A. intrudens</i>	293	48	341	2.0	....
<i>A. triseriatus</i> (E)	204	80	284	1.6	1.6
<i>A. fitchii</i>	195	21	216	1.2	....
<i>A. taeniorhynchus</i> (EW)	20	112	132	0.8	0.8
<i>A. dorsalis</i> (W)	4	79	83	0.5	....
<i>A. stimulans</i>	58	8	66	0.4	....
<i>A. implacabilis</i>	29	10	39	0.2	....
<i>A. trichurus</i>	20	2	22	0.1	....
<i>A. hirsuticorn</i>	7	4	11	0.0	....
<i>A. trivittatus</i>	27	2	29	0.1	....
<i>A. punctator</i>	6	....	6	0.0	....
<i>A. communis</i> †	....	....	....	0.0	....
<i>A. impiger</i> †	....	....	....	0.0	....
Total	8,298 ‡	9,310 ‡	17,608 ‡	100.0	76.4

* Vectors of eastern virus.

† Not collected in survey.

(E) = Vector of eastern virus

(W) = Vector of western virus

(EW) = Vector of both viruses

‡ 534 specimens (112 adults and 422 larvae), too young or mutilated to identify, are not included in this total.

Aedes, the third in importance numerically, is the one with which we are concerned in this paper as it contains all those species which have been demonstrated as able to transmit the virus of equine encephalomyelitis.

While all genera were found in practically all counties, the relative numerical distribution was uneven (Table 2), partly because volunteer collectors increased the number of specimens much more in some counties than others, but due also to other factors. The larger proportion of *Aedes* in the coastal counties is accounted for largely by the presence of two important salt marsh species not found in the remainder of the state.

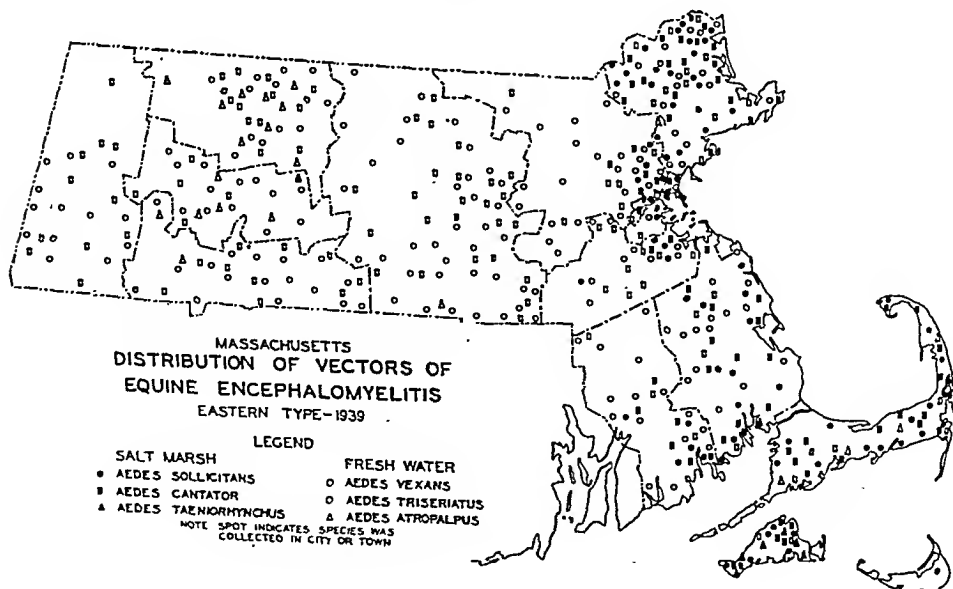
PREVALENCE AND DISTRIBUTION OF AEDES MOSQUITOES

Of the 21 species of *Aedes* which have been reported from Massachusetts, 19 species were represented among the specimens collected in the survey (Table 3). Six of these are known to be able

to transmit the eastern virus to laboratory animals and to certain wild birds.⁵ Of the six, three are salt marsh mosquitoes: *Aedes cantator*, *A. sollicitans*, and *A. taeniorhynchus*; three breed in fresh water: *Aedes atropalpus*, *A. triseriatus*, and *A. vexans*. One additional species, *A. dorsalis*, is capable of transmitting the western virus, and there is reason to believe that it, as well as other species of this genus, may be shown eventually to be able to transmit both of the viruses.

The relative numerical importance of the six known vectors of the eastern virus can be noted in Table 3. They comprise 76.4 per cent of the total specimens of *Aedes* collected in the survey. The very fact that the vectors are numerous may be the reason that already laboratory work has been completed to incriminate them. It is difficult to obtain some of the other species in sufficient quantities to perform conclusive experiments. In 1939, Davis⁵ was able to confirm the work of others that

MAP 1



Aedes sollicitans, *A. vexans*, and *A. cantator* may act as vectors and demonstrated for the first time that *A. atropalpus* and *A. triseriatus* may transmit the disease. His experiments with other species of the genus were inconclusive because sufficient numbers of mosquitoes were not available.

Three of the six vectors of the eastern virus are much more prevalent than the remaining three (Table 3). *A. vexans* heads the list with 25.1 per cent of the total *Aedes* specimens collected. *A. cantator* and *A. sollicitans* were collected almost as frequently while *A. atropalpus* comprised only 6 per cent of the total and *A. triseriatus* and *A. taeniorhynchus* represented only 1.6 per cent and 0.8 per cent respectively.

Geographical Distribution—These six species were distributed very unevenly. This variation was due in part to natural causes and in part to difference in completeness of collecting in the various counties. In Barnstable, Dukes, and Essex Counties, the activity of volunteers was responsible for the large num-

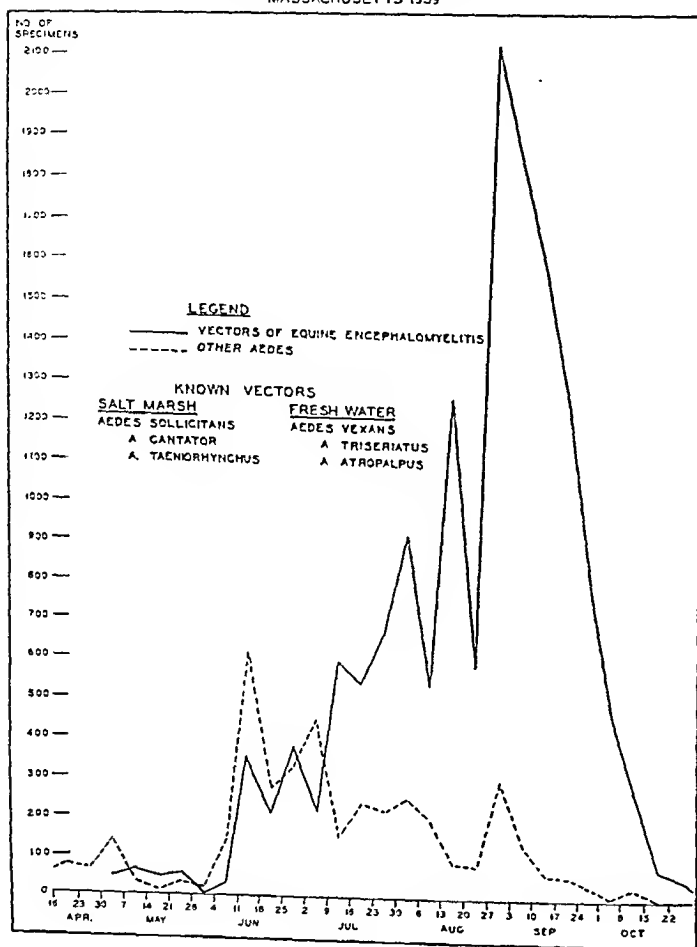
ber of specimens from these areas. The salt marsh varieties were limited, of course, to flight range from salt marshes and tidal-swept streams along the eastern and southern coasts (Map I). *A. sollicitans* has been recorded as flying as far as 40 miles when assisted by winds, but no salt marsh mosquitoes were found more than 15 miles from the nearest breeding place, the greater proportion being found within 5 miles of salt water. This may be accounted for partly by the fact that the prevailing winds during the summer are from the southwest and the west and, rather than assist, actually hamper the flight of salt marsh mosquitoes inland. No salt water reaches the counties of Berkshire, Franklin, Hampshire, Hampden, or Worcester, consequently no salt marsh species were found in these portions of the state (Table 4). Of the fresh water vectors, *A. atropalpus* was limited almost entirely to a circumscribed area in the Connecticut Valley in the western part of the state. *A. triseriatus* and *A. vexans*, on the other

TABLE 4
Numerical Importance of Vectors by Counties
Combined Total of Adults and Larvae
Massachusetts, 1939

County	<i>A. Atropalpus</i>	<i>A. Cantator</i>	<i>A. Sollicitans</i>	<i>A. Taeniorhynchus</i>	<i>A. Triseriatus</i>	<i>A. Vexans</i>	Total Vectors	Total <i>Aedes</i>	Per cent Vectors	Total All Genera	Per cent Vectors
Barnstable	12	1,780	1,198	0	7	1,751	4,748	6,635	71.6	35,123	13.5
Berkshire	0	0	0	0	45	337	382	465	82.2	26,413	1.4
Bristol	0	242	10	0	12	223	487	744	65.5	14,267	3.4
Dukes *	0	975	1,337	131	3	246	2,692	2,838	93.5	11,671	23.1
Essex	12	413	658	0	15	85	1,183	1,472	80.4	30,634	3.9
Franklin	183	0	0	0	26	198	407	483	84.3	13,204	3.1
Hampden	812	0	0	0	20	408	1,240	1,335	92.9	18,543	6.7
Hampshire	34	0	0	0	13	226	273	307	88.9	9,110	3.0
Middlesex	1	99	98	0	10	188	396	603	65.7	47,427	0.8
Norfolk	0	159	140	0	58	66	423	951	44.5	16,385	2.6
Plymouth	0	269	119	1	9	417	815	1,321	61.7	18,788	4.3
Suffolk	0	30	28	0	10	8	76	122	62.3	4,894	1.5
Worcester	1	0	0	0	56	273	330	866	38.1	30,089	1.1
Total	1,055	3,967	3,588	132	284	4,426	13,452	18,142	74.1	276,548	4.9

* Including Nantucket

SEASONAL PREVALENCE OF AEDES COMPARISON OF KNOWN VECTORS WITH OTHER AEDES MASSACHUSETTS 1939



in August, and rose to a high peak early in September.

INFLUENCE OF METEOROLOGICAL CHANGES

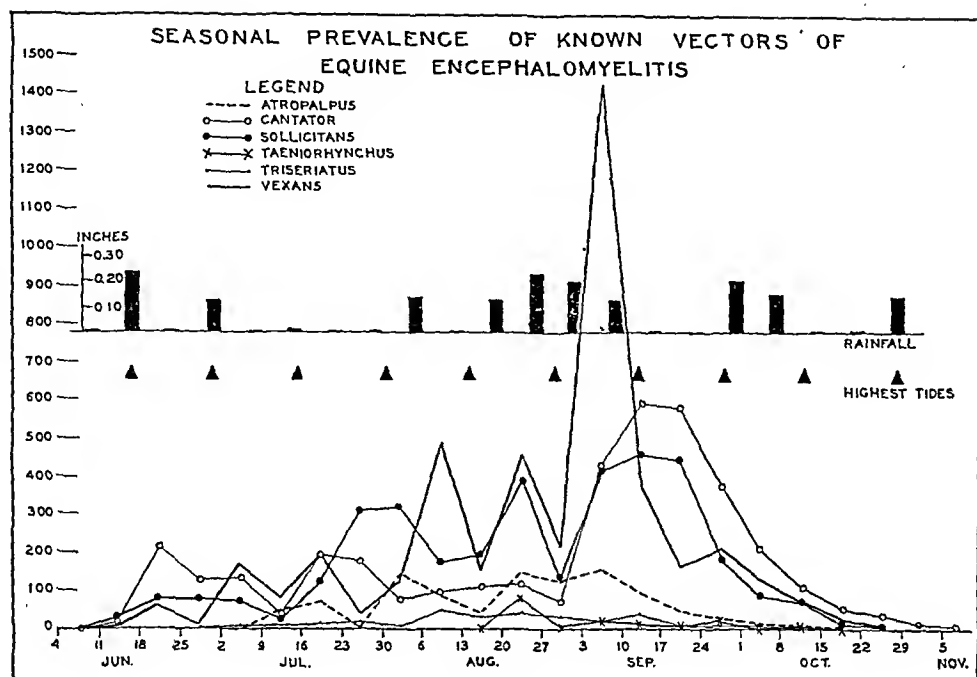
Tides and Rainfall—It will be seen from Graph III that in many instances the highest prevalence of salt marsh mosquitoes was found shortly after the highest tides, which occur about every 15 days, but when there was excessive rainfall during the period, the expected increase failed to appear. The fresh water species also tended to decrease during rainy periods but rose rapidly if

dry days followed. It will be seen that the greatest prevalence of *A. vexans* occurred in the dry period following the rainy weeks of August.

The year 1939 was much less favorable for the breeding of mosquitoes than 1938, due largely to the fact that rainfall was much below normal. The early rains in June and July in 1938 raised the level of ground water and filled ponds, marshes, and swamps. This was followed by decreased rain in August (Graph IV) which allowed uninterrupted breeding until the onset of the rainy period about the middle of September. In 1939, on the other hand, rainfall was below normal throughout the season, particularly in the early weeks of the summer. The

ground water level dropped markedly, marshes and swamps dried up, and some ponds disappeared. The prevalence of mosquitoes was therefore much lower in 1939 than in 1938.

Temperature—The difference in the prevalence of mosquitoes in 1938 and 1939 was also partly due to temperature conditions. In the former year, the summer months were warmer than normal, while in 1939 the early months of the summer were cooler than normal, and even the later months of the season were not warm enough for optimum breeding.



GRAPH III

HABITS OF AEDES MOSQUITOES

Biting Habits—It is usually stated that *Aedes* are vicious biters and that they bite mostly in the open. These statements are substantiated by observations made in the survey. Table 7 gives the mosquitoes which were caught on man. Over two-thirds of the 1,977 specimens were *Aedes*, *Mansonia perturbans* being the only other important species on the list. On the other hand, *Aedes* species represent less than 10 per cent of all the 3,130 mosquitoes caught in houses (Table 8). Further, it was observed that *Aedes* are not in the habit of frequenting barns and stables, as they formed only 20 per cent of all adults caught in such buildings.

When we consider the genus *Aedes* alone, we find that the adult vectors of the eastern virus represented 86 per cent of those caught on man, 73 per cent of those captured in houses, and 81 per cent of those caught in barns and stables. It is evident, therefore, that if a person or animal is bitten by an *Aedes* mosquito, other than in the

early spring months, it is very likely to be of a species known to be able to transmit the eastern virus. Moreover, it was noted that, whereas 60 per cent of the adults captured on man outdoors were vectors of equine encephalomyelitis, only 6 per cent of the adults captured indoors were vectors; and,

TABLE 7
Adult Mosquitoes Caught on Man

Species	Number of Specimens	Per cent
<i>Aedes sollicitans</i>	738	37.4
<i>Mansonia perturbans</i>	511	25.8
<i>Aedes cantator</i>	311	15.7
<i>Aedes vexans</i>	120	6.0
<i>Aedes aurifer</i>	52	2.6
<i>Aedes canadensis</i>	50	2.5
<i>Aedes cinereus</i>	47	2.4
<i>Culex pipiens</i>	42	2.1
<i>Aedes excrucians</i>	20	1.1
<i>Aedes intrudens</i>	19	0.9
<i>Culex salinarius</i>	14	0.7
<i>Aedes taeniorhynchus</i>	12	0.6
<i>Culex territans</i>	10	0.5
<i>Anopheles punctipennis</i>	7	0.4
<i>Culex apicalis</i>	6	0.3
<i>Aedes fitchii</i>	4	0.2
<i>Aedes triseriatus</i>	3	0.2
<i>Theobaldia melanura</i>	3	0.2
<i>Aedes species unidentified</i>	3	0.2
<i>Aedes stimulans</i>	2	0.1
<i>Anopheles quadrimaculatus</i>	2	0.1
<i>Aedes dorsalis</i>	1	0.0
Total	1,977	100.0

TABLE 8

Adult Mosquitoes Caught in Houses

Species	Number of Specimens	Per cent
<i>Culex pipiens</i>	973	31.2
<i>Mansonella perturbans</i>	911	29.2
<i>Anopheles quadrimaculatus</i>	407	13.0
<i>Culex apicalis</i>	189	6.0
<i>Culex territans</i>	165	5.3
<i>Culex salinarius</i>	85	2.7
<i>Aedes cantator</i>	56	1.8
<i>Aedes sollicitans</i>	56	1.8
<i>Anopheles punctipennis</i>	46	1.5
<i>Aedes vexans</i>	44	1.4
<i>Anopheles maculipennis</i>	27	0.9
<i>Culex species unidentified</i>	26	0.8
<i>Anopheles walkeri</i>	23	0.7
<i>Aedes triseriatus</i>	19	0.6
<i>Aedes canadensis</i>	17	0.5
<i>Theobaldia melanura</i>	14	0.4
<i>Aedes atropalpus</i>	12	0.4
<i>Aedes excrucians</i>	12	0.4
<i>Aedes aurifer</i>	11	0.3
<i>Aedes cinereus</i>	10	0.3
<i>Aedes trivittatus</i>	9	0.3
<i>Aedes fitchii</i>	6	0.2
<i>Aedes intrudens</i>	3	0.1
<i>Aedes species unidentified</i>	3	0.1
<i>Chaoborinae species unidentified</i>	3	0.1
<i>Aedes stimulans</i>	1	0.0
<i>Aedes punctor</i>	1	0.0
<i>Theobaldia morsitans</i>	1	0.0
Total	3,139	100.0

therefore, the chances of being bitten by a mosquito which may be a vector are perhaps ten times as great outdoors as indoors.

Breeding Habits — As mentioned above, the salt marsh vectors were limited to the proximity of tidal-swept marshes and streams. However, they were able to breed in waters of a wide range of salinity, and were found at many collection points associated with *Culex apicalis*, *C. pipiens*, *C. territans*, and *Aedes vexans*, and in fewer numbers with several other fresh water species. Of the three fresh water vectors, *Aedes vexans* was able to adapt itself to a wider variety of water collections than either *A. triseriatus* or *A. atropalpus*, which may account for the relatively higher prevalence of *A. vexans*. The adults of the latter, however, tend to seek the wooded areas and were collected less frequently than salt marsh species because collectors seldom went deep in such areas.

EVIDENCE OF MOSQUITO TRANSMISSION OF EQUINE ENCEPHALOMYELITIS

The observations made in the survey and epidemiological facts collected in regard to the 1938 outbreak which point to transmission by mosquitoes may be summarized as follows:

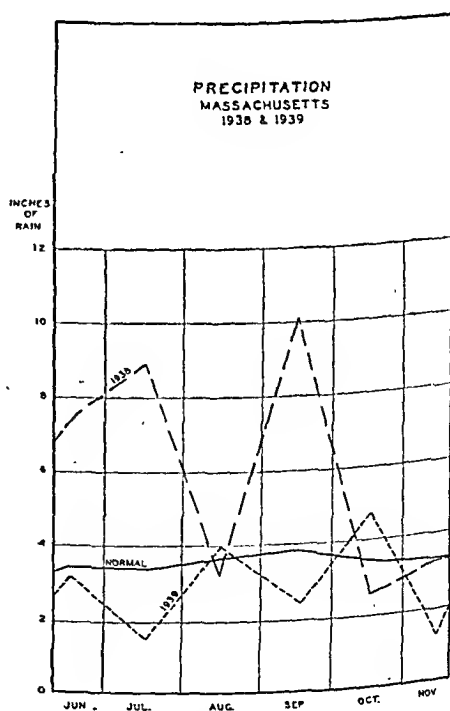
1. Six species of the *Aedes* mosquitoes of Massachusetts have been demonstrated as able to transmit the eastern virus in the laboratory. They formed 76.4 per cent of all specimens of *Aedes* collected in the survey.

2. The seasonal prevalence of equine encephalomyelitis and of mosquitoes coincides.

3. There were more cases among horses and human beings in 1938 when mosquitoes were numerous than in 1939 when they were fewer in numbers.

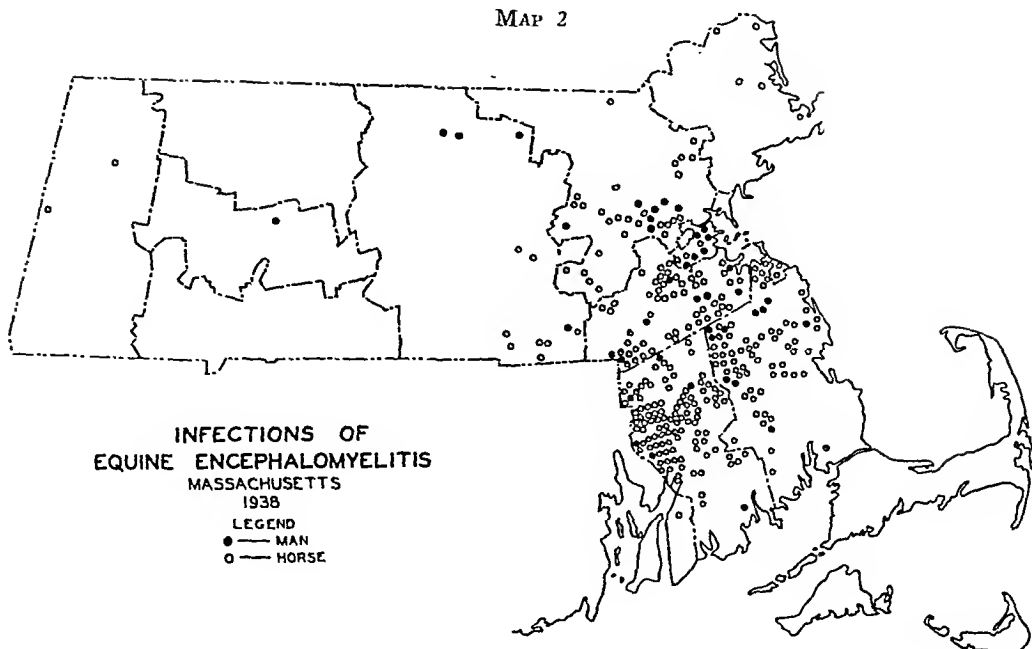
4. Human cases were most numerous in infants and young children who are less likely to protect themselves against bites by mosquitoes.

5. Horses pastured in the open, where vectors most usually bite, contracted the disease more frequently than those kept in stables.



GRAPH IV

MAP 2



INFECTIONS OF
EQUINE ENCEPHALOMYELITIS
MASSACHUSETTS
1938

LEGEND
● — MAN
○ — HORSE

Aedes vexans PROBABLE IMPORTANT
VECTOR IN 1938

There is evidence that, if mosquitoes were responsible for the spread of the virus of equine encephalomyelitis in Massachusetts in 1938, the most important species was probably *A. vexans*. The points in favor of this are:

1. Only two of the known vectors—*A. vexans* and *A. triseriatus*—were found in all of the areas in which the disease was prevalent in 1938.

2. *A. vexans* were 5 to 15 times as numerous in the survey in 1939 as *A. triseriatus*; they were caught on man 40 times as frequently and in houses twice as frequently as *A. triseriatus*, and were the third most frequent species caught in barns and stables, whereas no specimens of *A. triseriatus* were captured in such buildings.

MOSQUITO CONTROL IN THE PAST

Beginning in 1930 and 1931, active measures to limit the numbers of salt marsh mosquitoes were instituted in the coastal region of the state. Since the vast majority of salt marsh mosquitoes are *Aedes*, this genus is most affected by such measures. As a result, regions which previously suffered annually from the scourge report that the vicious

biting mosquitoes have been greatly reduced. It is very likely that, if the salt marsh *Aedes* vectors had not been greatly reduced by control measures, equine encephalomyelitis would have been much more prevalent along the coast in 1938.

Control of fresh water mosquitoes requires much more diversified methods than simple ditching, which is effective in tidal-swept marshes; and only in a limited number of urban communities have control measures been applied against these species. *A. vexans*, particularly, is an ubiquitous breeder, and control may be difficult if not impracticable. Because of the expense and difficulties, the control of fresh water mosquitoes is likely to be attempted on a large scale only if equine encephalomyelitis or some other mosquito-borne disease becomes prevalent.

SUMMARY

1. The objectives and results of a mosquito survey, carried out in connection with investigations on equine encephalomyelitis, are described.

2. Over 275,000 specimens, contained in almost 50,000 separate collections of adults

and larvae, were identified. Larvae formed 91.4 per cent, and adults 8.6 per cent of the total.

3. The three principal genera, *Culex*, *Anopheles*, and *Aedes* comprised 77.3 per cent, 11.9 per cent, and 6.6 per cent, respectively, of the total specimens collected.

4. Of the 21 species of *Aedes* found in Massachusetts, six species, which have been demonstrated able to transmit the eastern virus of equine encephalomyelitis, form 76.4 per cent of the specimens of that genus. On the other hand, they represent only 6.4 per cent of the total specimens collected.

5. Of the six vectors, three are salt marsh mosquitoes—*A. cantator*, *A. sollicitans*, and *A. taeniorhynchus*; they are found only along the coast, usually not more than 5 miles from the nearest salt water. The remaining three are fresh water species—*A. atropalpus*, *A. triseriatus*, and *A. vexans*; the first occurs mainly in the Connecticut River Valley, the other two are found throughout the state.

6. Three of the vectors—*A. vexans*, *A. cantator*, and *A. sollicitans*—comprise, respectively 25.1 per cent, 22.5 per cent, and 20.4 per cent of the total *Aedes*. The other three represent only 8.4 per cent of the total *Aedes*.

7. The peak of the prevalence of the vectors was reached late in August. They were, therefore, most prevalent just before the date of the peak of the 1938 outbreak of equine encephalomyelitis.

8. Vectors of equine encephalomyelitis

seldom enter buildings. Over 60 per cent of the mosquitoes caught on man were vectors, but less than 6 per cent of those captured inside houses were in this group, indicating that the danger of bites by vectors is perhaps 10 times greater outdoors than indoors.

9. *A. vexans* was probably the most important vector of equine encephalomyelitis in Massachusetts in 1938. This species is 5 to 15 times as numerous as *A. triseriatus*, the only other known vector found in all areas where the disease was prevalent that year. *A. vexans* is an ubiquitous breeder and difficult to control, especially so in rural areas.

10. In Massachusetts, salt marsh mosquitoes have been greatly reduced in the last 10 years by active control measures. It is likely that equine encephalomyelitis might have been more prevalent along the coast if the salt marsh vectors had been as numerous as in earlier years.

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Relation of Ammonia-Nitrogen to Break-Point Chlorination*

A. E. GRIFFIN, PH.B., AND N. S. CHAMBERLIN

Technical Service Division, Wallace & Tiernan Co. Inc., Newark, N. J.

DESPITE the many rôles chlorination now plays in the field of sanitation and in industrial practices, always of primary interest to the public health worker will be its accomplishments in the treatment of drinking water since it provides the most nearly perfect means for preventing the spread of water-borne disease.

It should be interesting, then, to discuss some recently observed phenomena related to the behavior of chlorine when added to a drinking water supply.

For the past thirty years it has been considered satisfactory practice to apply relatively small quantities of chlorine (in the order of 0.05 to 1 p.p.m.) to the water to be disinfected, and to control the application by maintaining a slight residual chlorine content in the water after a reasonably short (generally 10 minutes) interval between the time of chlorine application and performance of the simple colorimetric test by which this residual is determined. It was thought then, that the indication of a residual chlorine content in the treated water after this short time interval showed satisfaction of the immediate chlorine demand, and that additional increments of applied chlorine would result in directly proportional increments in the measurable chlorine residual. In

other words, were the observable data to be plotted graphically, the curve of residual chlorine content would parallel the curve of increasing chlorine application once the immediate chlorine demand had been satisfied.

Such a controlled method of drinking water chlorination has been correlated with bacteriological examinations often enough to indicate that this procedure was adequate for the purpose in the majority of cases.

There were, however, a number of instances where the chlorine demand was great enough to require the original application of much larger than normal amounts of chlorine, or where certain taste and odor causing substances were found to respond to increased chlorine application. To such higher rates of treatment the term "Super-Chlorination" has been applied.

In the light of the data which we propose to present here, it seems desirable that some descriptive nomenclature should be applied to the customary chlorine practice discussed above, and we suggest that the term "Marginal Chlorination" as being sufficiently adequate.

In some cases of super-chlorination it was found that increments of applied chlorine did not necessarily produce proportionate increments of chlorine residual. In some cases the chlorine residual increased slightly, and in others it disappeared entirely. This latter

* Read before the Laboratory Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

phenomenon led to an extended series of laboratory and field experiments to determine just what would occur when these increasingly larger amounts of chlorine were added to normal drinking water supplies. The data plotted from a vast number of these experiments disclosed the now familiar "hump and dip" chlorine residual curve which, in its simplest form, revealed the chlorine residual rising in some relation to the increasing application of chlorine until, at a certain point, the chlorine residual curve takes an abrupt downward trend—in some cases approaching zero—from which point on, with further increments in the applied chlorine, it rises directly proportional to these applied chlorine increments, and does actually parallel the applied chlorine curve. It is to this point of lowest chlorine residual that the term "break-point" has been applied.

In practice, curves depicting these data will vary all the way from the very pronounced "hump and dip"

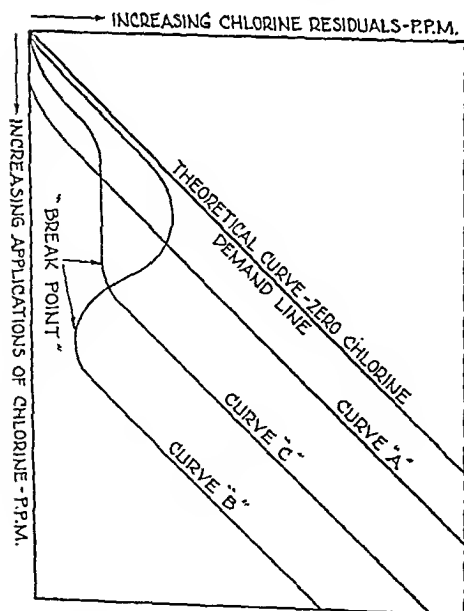
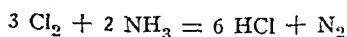


FIGURE 1—Typical chlorine residual curves obtained when water is treated with increasing amounts of chlorine.

curve (shown in Figure 1, Curve B) to the least pronounced curve (shown in Figure 1, Curve C). Occasionally the break-point of this latter type of curve may be somewhat difficult to find, although it will usually be revealed if the increments of chlorine application are sufficiently small and the work is carried on with sufficient care.

From time to time certain aspects of this phenomenon and certain results were observed and commented on. One of the earliest notices was that of Sir Alexander Houston¹ who, in his report on the Metropolitan Water Board of London in 1925, discussed several experiments on super-chlorination for taste and odor control, concluding with the remark that the more chlorine added the more certain would be the absence of tastes and odors after dechlorination.

In 1926, Howard,² of Toronto, confronted with an acute taste and odor problem, paralleled the investigations of Sir Alexander Houston and arrived at the same conclusion, later transferring these laboratory conclusions to actual plant practice. In the course of this work, Howard noticed a certain relation between the amount of nitrogen present and the amount of chlorine necessary for the production of satisfactory results. The following year Hale³ showed by tables that the chlorination of sewage effluents resulted in the loss of nitrogen. According to the figures presented, these losses indicated that the nitrogen combined with the chlorine in a ratio of 1:7.5, which led to the conclusion that the chlorine converted the ammonia to nitrogen and hydrochloric acid, according to the following equation:



Although in the intervening years attention was repeatedly drawn to the value of super-chlorination, the process failed to take hold, and was used but sparingly until 1939, when Faber,⁴ and

Griffin⁵ presented data indicating that practically all waters yield a break-point curve upon chlorination, and that success of the treatment revolved around this point. With interest thus aroused, Calvert,⁶ early in 1940, showed the "break" to be a function of the ammonia-nitrogen ($\text{NH}_3\text{-N}$) present. Simultaneously, and independently, the authors had further observed that waters containing nitrogenous material, such as milk wastes or sewage effluents, yielded pronounced "break-point" curves, whereas waters deficient in these forms of pollution and substantially free of ammonia-nitrogen, seldom produced a typical "break-point" curve upon chlorination.

With these preliminary data as a background, a series of experiments were undertaken to study the effect of varying amounts of chlorine on waters containing 0.50 p.p.m. of ammonia-nitrogen in the absence of interfering substances and at varying pH values (pH 5.0, 6.0, 7.0, 8.0 and 9.0). All test samples were buffered at these varying pH values with suitable buffers as outlined by Clark.⁷ In all cases, care was taken to add sufficient buffer to prevent any appreciable drop in the pH regardless of the amount of chlorine added. All pH determinations were made on a glass electrode. Temperatures were held constant and all tests were made in subdued light.

At the start of each test the distilled water, adjusted to the desired pH and containing 0.50 p.p.m. ammonia-nitrogen as ammonium chloride, was distributed into a series of gallon containers. These containers were then immersed in a running water bath at a temperature of 45°–48° F. Chlorine, as chlorine water, was then added to each bottle in the following concentrations: 0, 0.2, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0 and 11.0 p.p.m. Chlorine residual determinations were made on the various samples after 20

minute, 2 hour, and 24 hour retention periods. Ammonia-nitrogen determinations were made after the 2 hour and 24 hour chlorine retention periods.

In order to avoid all possible interferences, chlorine residuals were determined by the modified starch iodide method, wherein the addition of acid is omitted.

At the end of the specified time periods the excess chlorine, in 500 ml. portions, was neutralized with sulfurous acid, following which ammonia-nitrogen determinations were made. Sulfurous acid was chosen rather than sodium thiosulfate, due to the inability to obtain check results with the latter and in recognition of Raschig's⁸ statement that mono-chloramines are reduced by sulfurous acid to ammonia-nitrogen, and the work of Dowell and Bray,⁹ indicating that of the many reducing agents tried on nitrogen trichloride, only the sulfites reduced it quantitatively to ammonia-nitrogen (other reducing agents appearing to produce some nitrogen gas).

The pH of all samples was adjusted

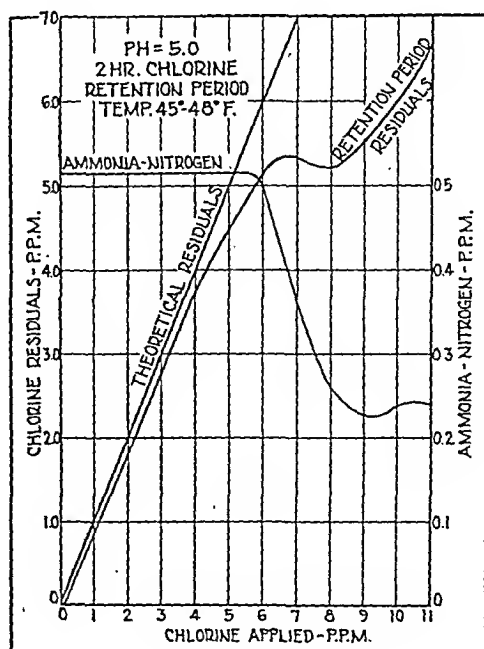


FIGURE 2

to 7.0–7.4 prior to distillation. Distillation was carried on at the rate prescribed in Standard Methods.¹⁰ Using Nessler's reagent, ammonia determinations were made on an aliquot portion of each distillate, the developed color in the known distillate being compared with known standards.

The results obtained at the end of 2 hours' contact are shown in Figures 2, 3, 4, 5, and 6, representing chlorine and ammonia-nitrogen residuals at pH values of 5.0, 6.0, 7.0, 8.0 and 9.0.

At pH 5.0, Figure 2, the "break" in the chlorine residual was so ill-defined, that in practice it might have been passed over without serious consideration. That it was the true "break" is substantiated by the loss in ammonia-nitrogen residual as the chlorine applications were increased beyond 6.0 p.p.m.

The "break" in the residual curve increased considerably in magnitude when the pH was increased to 6.0. Under this latter condition the residual at the top of the "hump" dropped from 5.35 to 0.42, and the residual at the bottom of the "break" dropped

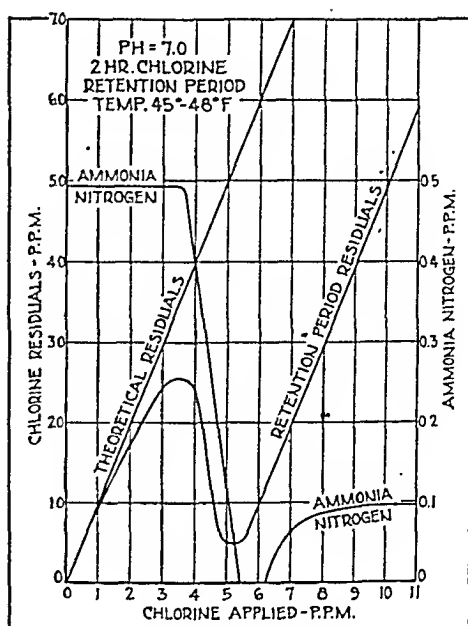


FIGURE 4

from 5.2 to 3.22. Likewise, considerably more ammonia-nitrogen was removed than at pH 5.0 (see Figure 3).

As the pH was increased to 7.0 there were further losses in residual chlorine

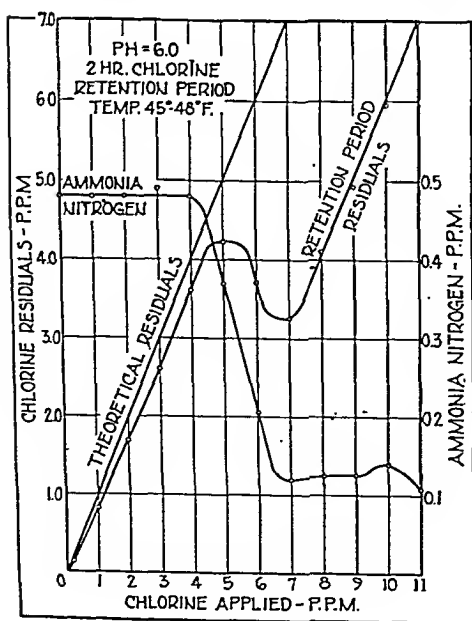


FIGURE 3

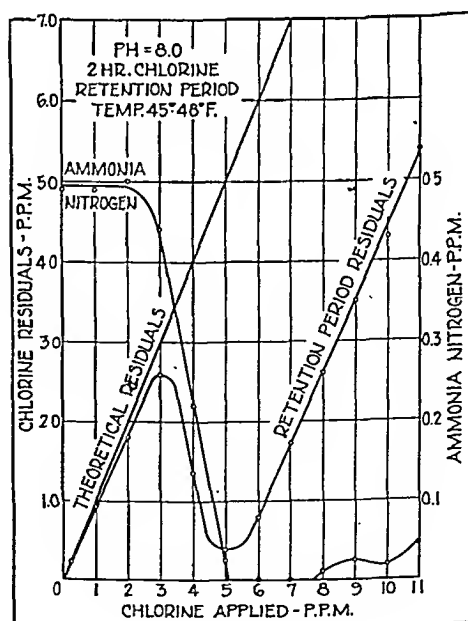


FIGURE 5

and ammonia-nitrogen with the latter disappearing entirely at the point where the chlorine residual had fallen to a minimum.

Further increases of the pH to 8.0 had little effect on the residual curve, although it did result in removal of considerably more ammonia-nitrogen than had been accomplished at any of the prior pH levels (Figure 5).

At pH 9.0 the ammonia-nitrogen residuals, instead of disappearing at the point of minimum chlorine residual, decreased in a smooth curve beginning at the point of maximum residual at the top of the "hump," and ending in no ammonia residual at the point where 11.0 p.p.m. chlorine had been applied. Under this condition of pH (9.0) the break-point curve, instead of approaching zero at the break, reversed its former trend, forming a break at a residual of 2.20 p.p.m.

These data led to the conclusion that under the conditions of this experiment the optimum pH for maximum development of the break-point curve lies be-

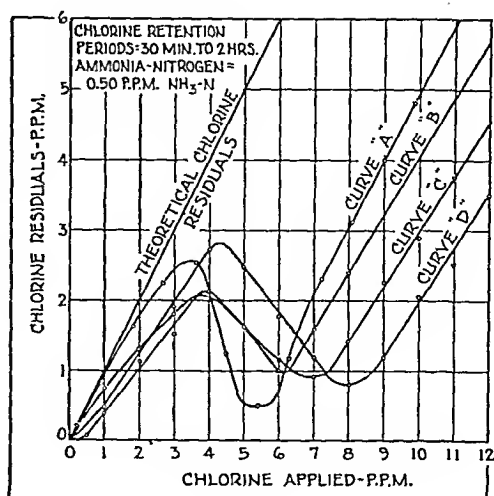


FIGURE 7

tween pH 7.0 and 8.0. Plant scale experience, however, indicates that this range may be increased to include pH values from 6.5 to 8.5.

Chapin,^{11, 12} and others, when working with relatively high concentrations of chloramines (1,000-2,000 p.p.m.) demonstrated the ratio of nitrogen to chlorine required completely to remove the ammonium ion to be on the order of 1:7.5. When, however, more dilute solutions were used ($70 \pm$ p.p.m.) this ratio changed to 1:8.5. In our experiment this ratio was found to be very close to 1:10 as evidenced by Table 1.

TABLE 1

pH	P.P.M. N Consumed	P.P.M. Cl ₂ Consumed	N:Cl ₂ Ratio By Wt.	N:Cl ₂ Ratio By Wt.
6.0	0.361	3.64	1:10.08	1:2.01
7.0	0.495	5.00	1:10.12	1:2.02
7.5	0.500	5.04	1:10.08	1:2.02
8.0	0.490	4.67	1: 9.54	1:1.91
Av.	0.461	4.59	1: 9.96	1:1.99

This ratio of 1:10, however, is good only for distilled water under the conditions above described. In practice, due to variations in amounts and types of impurities, temperature, and contact, this ratio usually deviates considerably from this figure, and the trend is usually toward a greater ratio. Ratios of 1:15 are frequently encountered and ratios of 1:25 are not unknown. The curves

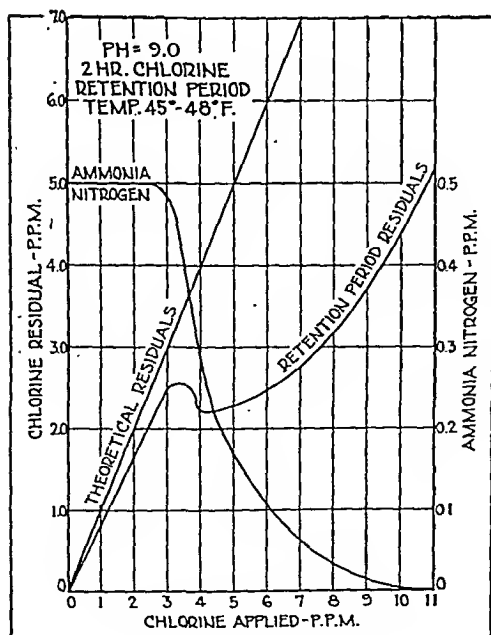


FIGURE 6

in Figure 7 obtained by the addition of varying amounts of chlorine to four different waters, each containing the same amount of ammonia-nitrogen (0.5 p.p.m.), are given as examples. Curve A, obtained by treating distilled water with chlorine, reacts according to theory: whereas Curves B, C, and D, representing three natural waters obtained from different sources, deviate considerably from theory, ranging from 1:11 to 1:16.

In conclusion it can be stated that:

1. The extent of the removal of the ammonium ion by treatment with chlorine depends to a large degree on the pH of the solution.

2. The optimum pH for the removal of ammonium ions and reductions in chlorine under ideal conditions is in the neighborhood of 7.0 or 8.0.

3. In practice the optimum pH for break-point chlorination lies between pH 6.5 and 8.5.

4. The ratio of ammonia-nitrogen to chlorine to reach the break-point under ideal conditions is in the neighborhood of 1:10.

5. The ratio of ammonia-nitrogen to chlorine to reach the break-point in practice, tends to increase 1:10 toward 1:15 or beyond.

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Care of Children with Heart Disease in the Crippled Children's Program Under the Social Security Act*

BETTY HUSE, M.D.

*Special Consultant on Crippled Children's Program, Children's Bureau,
U. S. Department of Labor, Washington, D. C.*

THE passage of the Social Security Act in 1935 gave recognition to public responsibility for the medical care of a group of the nation's growing citizens. For the first time a program for medical care was to be provided through grants-in-aid from the federal government to crippled children in the various states. The Children's Bureau of the U. S. Department of Labor, during the first 4 years of its administration of the portion of the Act dealing with services for crippled children, accepted state definitions of "crippling." These definitions have included orthopedic conditions, conditions which require plastic surgery, and, in a few states, operable eye conditions, rheumatic fever, and diabetes. In a broad sense, any physical disadvantage is "crippling" for a child if it renders achievement more than usually difficult and makes necessary for him more help or care than a normal child needs in order that he may grow and develop into a contented, useful citizen, able to complete in society with reasonable success.

THE CARDIAC CRIPPLE

Heart disease is one of many such crippling conditions. In 1939 the Children's Bureau set aside a portion of additional federal funds, made available by an amendment to the Social Security Act, for the purpose of developing state programs for children with heart disease and conditions leading to heart disease.

The inclusion of services for children with rheumatic fever and heart disease in the crippled children's program is a logical step in the expansion of medical care programs for children. There is no doubt that many children who suffer from rheumatic fever develop handicapping heart disease in the course of time. Rheumatic fever is a chronic recurrent disease that requires long and expensive medical and hospital care. This care is so costly that it may be a serious drain on the finances of fairly well-off families, and it is quite beyond the reach of families in the lower income groups, among which the disease has its highest incidence. In many communities, even were its members financially able to pay for them, medical services by physicians with the necessary experience with the disease and institutions equipped to care for these children are not at present available.

* Read before the Maternal and Child Health Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

When, in addition, it is realized that heart disease in children is a problem of great magnitude, occurring, according to available estimates, in about 1 per cent of the school population of the cities in the northern states, it seems peculiarly appropriate that public money and public planning should be focused on a medical care program for children with rheumatic fever and heart disease.

It should be emphasized that the prevention and cure of rheumatic fever and heart disease in children cannot be guaranteed by present methods of medical treatment, any more than the prevention of infantile paralysis and the cure of its resulting deformities can be guaranteed.

This humble realization of medical inadequacies should not, however, prevent us from extending to these children the best medical care at present available, with the reasonable hope that permanent handicapping will thus be minimized.

BASIC PRINCIPLES

The basic principles in developing services for children with rheumatic fever and heart disease as a part of the crippled children's program are identical with those on which services for crippled children with other types of handicapping conditions have been developed during the past 5 years. In brief, a program for crippled children should provide all the services necessary for good and complete care to children in need of care.

In order to insure good care, the Children's Bureau has made recommendations concerning administration of the programs and minimal acceptable standards, not only for hospitals and other institutions to be used in these public programs, but also for the qualifications of professional personnel. These recommendations have in all cases been made on the advice of special advisory

committees made up of experts in the various professional fields.

To be complete, care must include the full range of services itemized in the Social Security Act as "services for locating crippled children, and for providing medical, surgical, corrective, and other services and care, and facilities for diagnosis, hospitalization, and after-care."

Funds for services for crippled children under the Social Security Act are made available to the states for extending and improving services, not for replacing services already being rendered by private or public agencies. They are to be used "especially in rural areas and in areas suffering from severe economic distress."

ORGANIZATION OF SERVICES

With these principles as a basis, how are services for children with heart disease to be organized? In meeting this problem, the state agencies have the advantage of 5 years of experience in the administration of services for children crippled with orthopedic and plastic conditions. Many of the technics developed in caring for these children are directly applicable to the care of children with rheumatic fever and heart disease. In some details, however, there must be modifications of the crippled children's program, modifications implicit in the nature of the disease condition. The nature of the disease and consequent problems of medical care will be discussed in full by Dr. Jones* later, and the reverberations of these problems in the medical-social field by Miss Cohen.* Suffice it to say at this time that rheumatic fever is a long-drawn-out, chronic, recurrent infection of childhood, which requires long continued, thoughtful, and costly care. The aim of treatment must be not only to

* See papers in this issue, pp. 813 and 819.

prevent or minimize, in so far as possible, damage to the heart, but also to prevent or minimize the serious inroads which a chronic invalidizing disease like this is apt to make into the child's emotional life, education, and social adjustments.

Not only because of the paucity of funds at present available, but also because of the new problems to be met in the care of children with rheumatic fever and heart disease, it has seemed wisest in the beginning to establish small, localized programs, serving limited areas. Iowa is the only state at present extending services to cardiac children which has not restricted its program to a limited area. It is believed that if a small number of children in a state are taken care of adequately and completely and their problems studied, it will be easier later to extend services to other centers elsewhere in the state. These programs must necessarily be located where facilities are available for adequate care during the acute and chronic phases of the disease; on the other hand, the state agencies have been discouraged from establishing centers to serve urban locations where abundant, excellent facilities for care are already available to the community.

In developing these programs, emphasis is to be placed on rheumatic fever, the principal condition leading to heart disease in childhood, rather than on heart disease itself. Since the problem of rheumatic fever is primarily a problem of infection in childhood, the programs are being directed and medical services rendered by pediatricians, aided in some states by cardiologists as consultants.

The services of well trained public health nurses and medical-social workers are to be provided.

CASE FINDING

The locating of children with rheumatic fever and heart disease in need of

care will not be a difficult problem in the initial stages of the programs, since the funds available are too small to provide care for any large number of children. The usual sources for finding cases—private physicians, hospitals and clinics, public health nurses, welfare workers, and so forth—will be utilized in this program, as they are utilized in the program already developed for children crippled with orthopedic and plastic conditions. In a few states that are inaugurating cardiac programs, surveys, especially of school populations, are being contemplated for the joint purpose of finding cases and interesting the community in the problem; but for the most part the known need for services so far outstrips the extent of the funds available that no special case finding surveys seem to be needed. The high familial incidence of rheumatic fever and rheumatic heart disease calls for the examination of other members of the rheumatic child's family in any case finding program. Where rheumatic fever is a reportable disease, as in Michigan, Iowa, the District of Columbia, and the City of Chicago, another avenue for case finding is open.

Diagnostic services have a peculiar importance in these programs, for it is well known that many children are erroneously told that they have heart disease, on the basis of a cardiac murmur found in the course of a superficial physical examination. It is real therapy to remove the label of "heart disease" from a healthy child.

During the acute episode of rheumatic fever, hospital care is usually necessary. The state agencies have in general adopted the recommendations made by the Children's Bureau Advisory Committee on Services for Crippled Children with respect to standards to be met by hospitals used in this program, standards that include special provisions for the care of children, isolation facilities, and so forth.

CONVALESCENT CARE

During the long chronic phase of rheumatic fever it is advisable that children be cared for *outside* the "acute hospital"; The dangers of cross-infection to rheumatic children dictate this course, and the economic and psychologic disadvantages of a prolonged hospital stay are obvious. The problem of care during this stage is being met in different ways by the different states.

One solution is the use of the convalescent home if it can be staffed and equipped adequately to take care of children at bed rest. There are, however, very limited convalescent home facilities throughout the country. About one-half the states in 1930 had no beds for convalescent care at all. A method that is being tried out in a number of states is the use of selected foster homes, meeting acceptable child welfare standards, where children can be supervised regularly by physician and nurse.

I should like to emphasize that the problem of prolonged care for the chronically ill child has nowhere been sufficiently studied. Lack of facilities has forced the acceptance of inferior makeshifts, with a result that there has been a minimum of critical, thoughtful consideration of the way in which convalescent homes should meet the medical, educational, emotional, and social needs of children.

THE AFTER CARE PROBLEM

The care of the child who has recovered from an attack of rheumatic fever, regardless of the extent of heart damage incurred, is an extremely important part of the program. Eternal vigilance is needed to keep him in condition to resist further attacks of rheumatic fever, or, failing that, at least to detect the first early signs of reinfection in order to institute further care and rest. It has been recognized that if proper aftercare is to be given, provision must be made for the services of public

health nurses and medical-social workers, for little can be gained if a child who has been well cared for in hospital and convalescent home returns to a home where parents, through lack of understanding, neglect his health needs; to a home where there is an obvious lack of sufficient food, shelter, or clothing; or to a home in which there is discord based upon emotional conflicts and prejudiced attitudes in relation to the handicapped child.

There are other elements in the care of children with rheumatic fever and heart disease which are not strictly part of a medical care program, but which must be worked out in coöperation with other agencies. For example, the child's education should not be neglected during his prolonged illness, else when he returns to school he will have lost his place in his part of society. Mental hygiene is necessary to combat the many emotional disturbances engendered by such factors as prolonged invalidism, prolonged separation from the family, fear of heart disease, and so forth. Vocational guidance may be necessary for a few of the older children with seriously damaged hearts.

The problems to be met in extending services to children with rheumatic fever and heart disease, as a part of state programs for crippled children, are very many and very difficult. A start has barely been made in 9 states,* and about an equal number of other states are making plans for cardiac programs in the near future. All of us who are working with these problems, whether in the Children's Bureau, state agency, or local community, hope to learn a great deal in the coming years about the care of children with rheumatic fever and heart disease.

* California, Connecticut, the District of Columbia, Iowa, Maine, Oklahoma, Utah, Virginia, Washington.

NOTE: Since this article was written, two additional states—Maryland and New York—have begun providing services for children with rheumatic fever and heart disease.

Chronically Ill Cardiac Children in Institutions and Foster Homes*

T. DUCKETT JONES, M.D.

Director of Research in Rheumatic Fever and Rheumatic Heart Disease, House of the Good Samaritan, Boston, Mass.

IN the past three years there has been a decided increase in the interest of the general public relative to the problem of the child with heart disease.¹ Programs have been instituted in various sections of the country accepting this disease as a public health problem. I would like, therefore, to discuss briefly a few of the pertinent considerations relative to various features of the care of these patients.

It might be well to reiterate the fact that rheumatic fever, which is responsible for the vast majority of heart disease in children, is a chronic disease with various exacerbations and recurrences or recrudescences. The disease varies in severity from a severe acute and even fatal attack to one of a very mild or low-grade nature. Rheumatic heart disease has been observed to develop when rheumatic fever was a very mild illness. By such a mild degree of rheumatic fever I mean subclinical disease or rheumatic fever, the activity of which is indicated only by laboratory tests. Of primary importance in the care of these rheumatic fever patients, as most observers agree, is a seemingly close relationship between infection of the upper respiratory tract and recur-

rences of the disease. The upper respiratory tract infections, often associated with recurrences of the disease in the northern part of the United States, usually have a coexistent infection with the hemolytic streptococcus. The rôle played by the hemolytic streptococcus is the subject of much controversy at the present time, and despite one's ideas concerning etiology, it seems probable that many types of this organism may play an important part in the natural history of the disease. While other events such as operative procedures, accidents, extraction of teeth, and non-streptococcal illnesses seemingly precipitate recurrences of the disease, they do not represent a group of statistical importance, since infection of the upper respiratory tract is by far the more common occurrence in any of these population samples. Patients with rheumatic fever and heart disease seem peculiarly susceptible to infections of the upper respiratory tract, although no data have been presented which indicate that they are more susceptible than many other members of the community in which they live.

Since no specific therapeutic measures are available for the treatment of rheumatic fever, we may assume that the majority of students of the disease believe in rest as an important feature of the care of these patients, once the

* Read before the Maternal and Child Health Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

acute stage has subsided. This brings up important features relative to the programs for the care of rheumatic fever subjects. If one accepts the advisability of bed rest so long as rheumatic fever remains active, he must carry this through consistently until the nonspecific laboratory tests have returned to normal. It is essential that this be accepted, since during periods of even mild rheumatic fever, these patients are susceptible to developing an increase in the severity of their disease, and indeed it is during such periods that severe, even fatal, rheumatic fever often develops.

The problem hence becomes one in which several different types of care are important. One must be aware that it is very advisable that there be consistent medical thought and consideration during the various phases of the disease. It is likely that the program for the care of rheumatic fever patients has been long held up because of general lack of acceptance by the medical profession that these patients need further supervision and care once they are sufficiently well to leave the wards of the general hospital. Too readily have visiting physicians in general hospitals been anxious to dismiss medical responsibility upon discharge of the patient from the ward. No physician knows rheumatic fever well who has not observed these patients in all stages of the disease. Continuous medical observation and supervision are necessary. The patient needs the same medical consideration in the acute hospital, chronic institutions, and convalescent or foster homes. It further may be agreed that comparable nursing supervision and competent medical social work are necessary throughout the course of the disease.

It may be well to discuss the types of institutions and types of care which offer particular advantages to patients at various stages of rheumatic fever.

It has not been unusual to find institutions caring for these patients, unaware of the service they are best qualified to give.

CARE FOR THE ACUTELY ILL PATIENT

Since rheumatic fever is largely a disease of relatively low economic levels, it must be assumed that it would be difficult for the family to finance care in the home for a protracted, severe illness. At times, such patients may remain acutely ill for several months, requiring almost constant medical and nursing supervision. Especially is this true of those patients who develop congestive heart failure, and this may persist for periods of several months. One need not argue that such a condition could not be properly cared for in the home, but it will be found the general rule that during acute illness most patients with this degree of rheumatic fever are best cared for in hospitals. Up to the present time, it is only at this stage of the disease that varied types of medication are of great help to the patient.

There is one decided difficulty concerning the care of these patients in the wards of general hospitals. Here they are exposed freely to varied types of infection present in the community. It is advisable that as soon as the patient has recovered sufficiently, he be moved to an atmosphere where he is exposed less frequently to infection, especially of the respiratory tract. There are several ways in which patients may be cared for at this stage of the disease.

CARE FOR PATIENTS WITH CHRONIC RHEUMATIC FEVER

A number of rheumatic fever patients having severe forms of the disease of a more or less progressive nature must remain in the wards of the general hospital for indefinite periods of time. A few institutions have been developed, less expensive than the general hospital,

where protracted bed care with excellent medical and nursing supervision can be obtained. In many instances such institutions are not available. It is obvious that they cannot be far removed from the center of population which they serve, since these patients are notoriously subject to an increase in the severity of their disease with slight provocation. These patients should be protected as much as possible from intercurrent infections and require exceedingly careful medical and nursing supervision. An institution giving the type of care comparable to that given infirmatory patients in sanatoria would be satisfactory. But again it must be repeated that it is not advisable to consider transporting these patients any great distance from their homes since, with increase in the severity of the illness and a possibly poor outlook, it would be inadvisable to have the patient so far away from their families as to prevent frequent visits.

Mild or low-grade chronic rheumatic fever—At this stage of rheumatic fever there may be mild clinical symptoms of the disease or merely laboratory evidence of rheumatic fever. They still remain susceptible to increases in the severity of their disease, and their outcome is often influenced by intercurrent respiratory infections. It is at this stage of the disease that many convalescent homes throughout the country have taken patients only to find that they cannot give them adequate medical and nursing care, or protracted bed care. Institutions taking such patients must be able to give them bed care and protect them if possible from respiratory infection. In some instances these patients have been cared for by the use of chronic hospitals where the patients are in small groups, and more recently sanatoria have been utilized for this purpose. A most successful two year experiment has recently been conducted in Boston at the

Sharon Sanatorium by Drs. John P. Hubbard and W. A. Griffin.² In this experience a small number of patients (20 each year) have been cared for in the same open air pavilion in which children with tuberculosis were formerly treated. This allowed for dilution factors as far as air-borne infection was concerned. There was a striking improvement of these patients in such an environment, and no rheumatic fever recurrences. This experiment, which now extends over two years, has been satisfactory and will shortly appear in the literature. It offers a good many advantages, but also has disadvantages, such as the necessity of distance from the local center of population which it serves, the difficulty of medical supervision, and the fact that should an epidemic occur in this group it would result in serious problems and an exodus back to the general hospital. In addition, it is too early to predict a constant satisfactory result as annual variations in the disease are well known. It would seem that the use of sanatoria located an appreciable distance from the community served would present tremendous difficulties. Any institution caring for patients of this type cannot consider itself purely convalescent, since the period of stay and bed care during active rheumatic fever has been found to be usually 6 months and in many instances two or three years. Bed care for this protracted period of time offers many differences from ordinary convalescence.

It has seemed probable that foster homes in which there were a very limited number of children might serve a useful purpose of caring for bed patients with mildly active rheumatic fever. In fact, this has been satisfactorily carried out in some cities. This type of care can be developed in most communities. Intelligent foster mothers, frequent nursing supervision, and at least weekly visits by the physician are

necessary. A small number of children in each home is advisable. It offers the distinct advantage of small groups and hence curtails the probability of exposure to respiratory infection. It is needless to state that such foster homes could care for patients at only one stage of the disease since it would be a difficult psychological problem to have some children in the home having a fair degree of physical activity while others are restricted and kept in bed. It is also obvious that there should be a close affiliation between the medical, nursing, and medical-social services of the foster home, and these services offered the same child at a different stage of his disease.

CARE DURING INACTIVE RHEUMATIC FEVER

When rheumatic fever becomes inactive, it is safe to begin a schedule of slowly increasing physical activity. After freedom from active rheumatic fever for some time, we have found it advisable to restrict physical activity only in those patients with reasonably severe, permanent heart damage. It is surprising how many children with mild to moderate rheumatic heart disease are able to lead active physical lives. At this stage in the course of the disease there is a choice of one of several opportunities which may be offered to the patient.

The use of convalescent homes—The convalescent home in which children may be cared for in small groups, hence decreasing exposure to infection, offers the patient an opportunity to return to a physically active life under supervision. Such homes form a valuable adjunct in the care of the patient. In many communities such convalescent homes are not available and one has to rely on the use of foster homes. It must be remembered that the location of the home, and the usual medical and nursing service available, do not equip the

average convalescent home to care for patients with active rheumatic fever.

The use of foster homes—Foster homes in which there are only a small number of children, preferably not more than two or three, serve quite satisfactorily in this regard. The Speedwell Society of New York has conducted an admirable foster home type of care and has demonstrated its worth during the inactive stage of the disease.

The use of the patient's own home—Concerning convalescence in the patient's own home there are many features to be considered. Again the type of care which is available depends on the intelligence of the parents, the economic level of the family, and the number of siblings. We have found that with a large number of small children in the family and consequent crowding, there is a distinct increase in the exposure of the patient to whatever infections are existent in the community. If there are not too many young children in the family and the patient can obtain good parental supervision, with an adequate diet, have at least a bed of his own if not a room alone, much can be accomplished in his own home. Here one really comes in contact with the medical-social aspects of the disease, and an exceedingly important problem relative to the individual factors which will help the patient through his long illness and maintain his psychological equilibrium and a proper attitude to his difficulty. Many of the important considerations concerning the decision to care for the patient in his own home cannot be elaborated here.

GENERAL PRINCIPLES

It would be remiss to end this brief discussion without stating that the organization of rheumatic fever and rheumatic heart disease programs will vary greatly in different communities. Existing institutions and agencies should be utilized whenever they exist. However,

there are general considerations which may be briefly enumerated.

1. There must be provision for adequate medical and nursing care during the acute illness.

2. In many instances this same type of care must be available for months or even a year or more.

3. Bed care during even mildly active rheumatic fever is generally agreed upon as advisable and beneficial.

4. Gradual return to an active life, dependent upon the amount of permanent heart damage, is advisable.

5. Consistent medical, nursing, and medical-social observation and care should be available throughout the various stages of the illness.

6. Protection from respiratory infection should be carefully considered throughout the program.

7. Aftercare or follow-up during the inactive phase of the disease is of primary importance, especially from the medical and medical-social aspects.

8. An attempt must be made to keep the patient up to his regular scholastic level. This is relatively easy in institutions, but necessitates regular home instruction at some part of most programs. Special cardiac classes are in general to be avoided if possible.

9. Occupational therapy or handicraft work is a valuable aid in keeping the patient contented and aids recovery.

10. Vocational guidance and training are necessary for the comparatively small group of patients who reach adolescence with moderate to severe rheumatic heart disease. The majority of patients reaching this age are able to lead active physical lives.

It would be remiss also not to mention the family as a unit since much attention has been paid in recent years to the fact that there is just as high an incidence of multiple cases of rheumatic fever in a family as is found in tuberculosis. There have been recent convincing studies concerning hereditary factors playing an important rôle in the disease, and in general there is an indication that there may be a hereditary susceptibility. This does not rule out the factor of environment or contagion, and we do not know to what extent removal of a source of infection from

the family will do so far as curtailing exposure of other members of the family. This is an important feature for future observation along with a study of the effect of better housing conditions.

Institutionalization of these patients can rarely be avoided, no matter how desirous one is of caring for them in their own home. We must therefore face the question of the psychology of the patient and what may be done in order to prevent him from becoming a psychological cripple. It has been my general experience and that of a number of others, that those patients are psychologically better who are cared for along with a group of similar patients, than if they receive a tremendous amount of attention in their own homes. In groups they can be better educated concerning the problem which their disease presents, and may face the problem in a more rational way. They may also be given simple occupational handicrafts more easily, and these serve well as substitutes and help in keeping the patient happy. While this feature is beyond the scope of this presentation, we must remember that it is essential to aid the patient to accept the situation rationally, and thus prevent psychological and emotional difficulties.

THE PROBLEM OF CONCURRENT RESPIRATORY INFECTION

Despite the obvious variations available in determining a given community program for the care of rheumatic fever and rheumatic heart disease patients, there is one rather inescapable feature which we must face. It would be wise for us to realize and accept this early in the development of public health programs. Patients with rheumatic fever and rheumatic heart disease do not tolerate respiratory infection well. Pharyngitis or tonsillitis and colds with secondary hemolytic streptococcus infection are especially deleterious to these patients. They have profoundly

affected the natural history of rheumatic fever in our group of patients. In our experience³ one-half of the patients with mild or recent rheumatic fever, having hemolytic streptococcus pharyngitis or tonsillitis, have a recurrence of or increase in the severity of rheumatic fever. This occurs in about one-third of those patients having simple coryza. We do not yet know how or why the hemolytic streptococcus or respiratory infection plays so important a part. More recently we have become aware of a further distressing feature.⁴ In carefully studying the throat flora of these patients, we have frequently noted a change to a predominantly positive culture of a virulent type of hemolytic streptococcus two to three days before any clinical respiratory infection, if indeed any ever develops. Thus, these organisms may be easily spread from one patient to the other, if we rely upon ordinary clinical symptoms before instituting isolation precautions. Further, patients presenting these cultural changes, but no clinical respiratory infection, may have a recurrence of rheumatic fever. In a broad clinical and bacteriological experience during the past year, no recurrence of rheumatic fever or increase in the severity of rheumatic fever was seen which was not preceded by a hemolytic streptococcus respiratory infection or a distinct cultural change in the throat flora.

This is the most difficult feature of any program. If we do not accept it, we may cause great delay in the sane development of public health programs. It is obvious that small units are advisable, and that exposure to respiratory

infection must be minimized. This raises the question of the part played in preventing the spread of air-borne infections by such methods as adequate ventilation and perhaps irradiation of air by ultra-violet mercury vapor lamps. These methods, still in the experimental stage, may offer much to curtail those factors which seem to play a part in the recurrence of rheumatic fever in patients, especially when low-grade or recent rheumatic fever has existed. Wherever practical it is suggested that in assembling groups of rheumatic fever patients, bacteriological work of a high order be made available so that epidemics may be carefully controlled and hence deleterious effects on the course of rheumatic fever obviated. It is true that the patient's home is often an excellent place for exposure to infection, but in removing the patient from his usual habitat, we must try to place him in an atmosphere which will at least decrease as much as possible the exposure to factors which may result in an increase in his disease or a recurrence of it once the disease has subsided to the inactive level. Should this ultimately be possible, we will doubtless save many lives and substantially lessen the amount of permanent heart damage in others.

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Medical-Social Problems of Rheumatic Children*

ETHEL COHEN

Director, Social Service Department, Beth Israel Hospital, Boston, Mass.

RHEUMATIC disease, a long continued infection, is a potential source of medical-social problem for all children who become infected by it. The course of the disease and the very nature of regimen for care interfere with the child's usual activities. A disease of childhood, it most frequently occurs in the early formative years and during adolescence, when children normally experience their greatest problems in physical and psychic development.

The high incidence of rheumatic fever in the lower economic groups indicates that poor housing, overcrowding, exposure to infections, and inadequate nutrition are important etiological factors.

Problems for rheumatic children may result from the following:

1. Social factors leading to the development of the illness
2. Deficiencies in community organization that deprive children of medical, auxiliary health, and other services
3. Personal or environmental difficulties that obstruct treatment and care or prevent the maximum possible reduction of disability and rehabilitation

Therefore, this paper will consider medical-social interrelationships in two phases, the patient's personal problems and community organization.

PROBLEMS ASSOCIATED WITH MEDICAL CARE

The first essential need of a child with rheumatic fever is continuous medical care of good quality. Under some conditions, however, either of personal circumstances or of community organization, this may be completely beyond the child's reach.

For example, a public assistance worker in a western state found a sick child in the home of a client. Her subsequent study of the case revealed that the child, seriously ill with rheumatic fever, had been denied medical care because her mother was convinced no doctor in the state was qualified to treat her. The mother, a layman, was treating the child on the advice of a practical nurse, her friend, who had been caring for another patient with what seemed to be a similar illness. Mother and friend were carrying out their own ideas of treatment, while the child's condition was growing progressively worse.

Another child in the same state, a member of a more intelligent family, had been discharged from a university hospital following a period of treatment for rheumatic heart disease. The hospital, about 200 miles from the home, was the nearest one available. During the 4 years after her discharge, the child had repeated and increasingly severe exacerbations of illness, with no

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medical attention. The community in which the child lived had no facilities for medical care. The family had no means of getting her back to the hospital, which, like many others, had no contact with patients following their discharge.

This lack of medical and hospital facilities in rural areas means that children are deprived of even the most rudimentary care. Few state agencies had assumed any official organized responsibility for children with rheumatic fever until this year when grants from the Social Security funds through the U. S. Children's Bureau stimulated the development of programs. These, however, will at the outset be limited in scope, and there will still remain in many urban and rural areas of the country large numbers of children without the opportunity even for medical examination.

Often the existing hospitals and clinics are located at centers remote from large sections of the state, and children are deprived of care unless provision is made for their transportation. Too little attention has been given to the subject of transportation facilities. Some large counties have neither railroad nor bus lines. Occasionally, neighbors or relatives may be able and willing to spend long hours on the road and in waiting for the patient's examination, but such resources and such generosity are not generally available. Rural education made real progress after the establishment of consolidated schools, but their present state of development could hardly have been attained without provision for pupil transportation. With similar planning, clinic and hospital care could be brought within the reach of thousands of medically neglected children.

CARE FOR THE CONVALESCENT

Medical care for many rheumatic children extends beyond the general

hospital, often for long periods of time, and requires complete bed rest. For many patients this may be carried out at home, but large numbers of children lack the type of homes where physical and mental rest is possible. Institutions or foster homes of accepted standards, according to the individual child's need, can be good substitutes. However, these resources are even more lacking in most communities than are hospital facilities. Hospital treatment of patients with rheumatic fever insufficiently supplemented by a good quality of aftercare is wasteful. Early recurrence and hospital readmission usually result.

Consideration for the sick child, and not alone for the disease, implies a concern for the promotion of his normal development as a useful member of society. The principal elements are opportunities for play, education, work, group life, and a sense of emotional security. The possibility of the patient's participating in any activities during the acute stage of his illness cannot be discussed here. However, during the chronic and convalescent phases of the illness, provision can be made for schooling, for recreation, and for occupational therapy, wherever the child may be—in his own home, in a foster home, or in an institution for convalescent or chronic patients. The public school systems of many communities supply visiting teachers for home-bound sick children. Many institutions caring for chronic patients have regular classroom instruction enabling children to maintain their place in school. Occupational therapy, as recreation, as therapy, and as a stimulant to creative work, has been effectively established in institutions and in the homes of patients by associations of both professional workers and laymen.

A recent visit to a convalescent home demonstrated how ingenuity, resourcefulness, and interest can create fine recreation for disabled children. A

pageant of medieval life with costumes and decorations was being rehearsed. The patients had painted the decorations and made the costumes. Beds and wheelchairs had been brought into the recreation room. Many children participated as actors, reciting their lines from wheelchair or bed. Each patient had some rôle well within his capacity. One boy was so disabled that he could do no more than control a little electric light switch from his bed. The atmosphere of the place was not one of illness or invalidism. Instead, one felt the gaiety, the child's natural love of play-acting, and the wholesome expression of responsibility and participation in group activity.

REHABILITATION

On the subject of school attendance after return to community life there are different points of view. Some favor special classes or special schools for children with heart disease, as a means of giving them protection through supervision by teachers who understand their disability and their limitations. Unless the system provides for physical examinations at reasonable intervals by doctors trained for this work, followed up by recommendations and by change in the child's activity as needed, the maintenance of special classes and schools would seem to be of little value except that they eliminate competition with well children. Attendance at the usual community schools is advocated by some who fear the disadvantages of segregation. Explanation to the appropriate school personnel of the child's condition and physical limitations has often resulted in adjustments compatible with his needs. Certainly, in every community the professional personnel engaged in the care of children with rheumatic fever have a duty to work with the boards of education for the establishment of suitable school facilities.

Education both precedes and is part of preparation for vocational life. For many of these children the potential threat of recurrent and progressive illness emphasizes the importance of their engaging in vocations which will neither lead to blind alleys nor contribute to physical breakdown, but will maintain them through adult life in satisfying and useful work. This requires skilled guidance and placement service as an integral part of community organization.

Competitive industrial life even under ideal conditions will be physically impossible for some children. However, many of these can function successfully within their limitations on specially designed projects, where their useful work can be adequately compensated. The personal transformation observed in several young adults after placement on a WPA project for the handicapped has been eloquent testimony to the constructive possibilities of special workshops.

A discussion of medical social elements in the community aspects of rheumatic disease comes to a natural climax on the subject of bad housing, which, as a component of poverty, is perhaps the most important point of all. Sunless, damp, unsanitary, crowded homes are breeding places of rheumatic disease. Insufficient food and improper diet foster its development. Thousands of children exist in families subsisting on marginal incomes or on financial aid below minimum budgetary requirements. Many live in areas in which they can obtain no public financial assistance. The impetus given by federal housing activities must be accelerated and employment opportunities need further stimulation. It has even been said that "rheumatic heart disease would largely disappear if decent housing and wages became the order of the day."¹

To the usual unpredictables of life, there is added for the child with rheu-

matic fever the unknown factor of the course of his particular rheumatic infection. His opportunities for attaining the average span of life are dependent upon many things.

EMOTIONAL PROBLEMS

Do the parents really care about this child and wish to help him? Can he feel himself secure in his home, or is he made to feel himself a nuisance? Has an overburdened mother, weary of the exacting demands of a child in pain, or bored by inactivity, become too severe in discipline or given it up altogether in despair? Does fear of sudden death obsess the patient or family? Will overanxiety create invalidism, or will indifference result in insufficient supervision? Are essential basic needs met, and diversion and companionship available as well? Is there jealousy among sisters and brothers because of increased attention to the patient? Is there rivalry between the patient and his healthy younger brothers and sisters who are able to carry on the patient's favorite sport or activity no longer possible for him? Is the atmosphere harmonious enough to promote long-time rest and relaxation? Is the child constantly excited and upset by over-exuberant spirits in the household? Is there intelligence enough to carry out medical directions? Does the family possess the necessary self-discipline to part with the child for many months, or perhaps for several years of care away from home?

Neither academic nor hypothetical, these questions arise from considerable experience with clinic and hospital patients. The emotional reactions implicit in these questions are among medical-social problems which must be anticipated or dealt with as they arise to obstruct the care of rheumatic children. In addition to these reactions which center largely about interpersonal relationships within the home, there may be

adverse emotional reactions in relation to play, school, work, and other activities. A child may make capital of even a slight cardiac murmur as an advantage over playmates, or as a means of being excused from the school activities he dislikes. To retain his place among schoolmates he may indulge in excessive activity. Prolonged or repeated absences from school may retard a child several years. Nothing is more disturbing to some children than to be left behind their own age groups in school. Under such circumstances, children often lose interest, regress mentally, do poor work, or leave school entirely. Yet without elementary education the opportunities for work other than unskilled labor are exceedingly limited.

In work, adolescents often need encouragement from understanding employers who will give them opportunity to develop. The practice in some industries of excluding persons with heart disease from activities which they are quite capable of carrying on, will be gradually eliminated, it is hoped, by further education of the public.

THE COMMUNITY AT WORK

This exposition of medical-social problems of children with rheumatic fever may seem to present a discouraging and rather hopeless picture of the situation. Quite the contrary is the fact. Experience has led practically all authorities to believe that the progress of the disease may frequently be retarded, the incidence of recurrence lessened, and disabilities minimized by adequate solution of the medical and social problems involved.

When the diagnosis of rheumatic infection or rheumatic heart disease in a child has been made in a clinic or hospital, the medical and social elements in each case should be studied simultaneously, to ascertain any potential difficulties which may create problems or obstruct treatment. Throughout

the period of treatment and convalescence there must be a conscious awareness of the continuous interplay of medical and social elements. Many children will have resources within their own personalities or within their families to carry along the whole burden of illness; but many others will be lacking in some or even perhaps all of the necessary constituents of care. In clinic or hospital there should be available to contribute to programs of care, as outlined, trained medical social workers who have a comprehensive knowledge and understanding of the individual child, his family, and his social environment. Their training prepares them to understand the meaning of illness, the interrelated social problems of illness; develops skills to serve the patients in collaboration with the physician; and to function as representatives of the hospital in relation to other agencies in the community. Too many hospitals have no qualified medical social work-

ers, and too many local communities lack other social case workers who can effectively assist patient and families to make the required home and other adjustments. The expansion of community organization as suggested at the beginning of this paper must be accompanied by an increase in the number of well qualified trained personnel in the various professions—medical, nursing, dietetic, and social service—each carrying out the special function of his own particular field, but always in co-ordination with all the others.

By reducing the unmet needs in community organization, and by a fuller realization of the individual personal and family difficulties in relation to rheumatic disease, some real progress, it is hoped, can be made toward the solution of this serious problem.

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Centralized Collection of Marriage and Divorce Records and Their Uses*

BERNARD M. COHEN, PH.D.

U. S. Bureau of the Census, Washington, D. C.

MARRIAGE and divorce, and the problems of collecting the records of their occurrence, may seem rather outside of the interests of public health. But public health must be concerned with marriage, both as an event which marks the beginning of a new family and as the designation of a pattern of living.

Public health is directly interested in all the circumstances which affect the well-being of an individual throughout his life. His physical and mental health, his personal and social adjustments, his adequate functioning as a citizen and parent, are all involved in his well-being. Present-day medicine recognizes that none of these factors can be neglected in appraising an individual's health, and that the changing social and personal relationships he encounters at every stage of life are significant in determining his general fitness.

Marriage is so universal and natural an undertaking that its far-reaching consequences for public health are often lost sight of. From every point of view marriage is an important event, for the person who marries, for society, and for public health. With marriage, the individual's social status changes and a new family is created. His effective reproductive life usually begins at this

point and he enters into a new world of personal and social responsibilities. The health officer cannot avoid the public health implications of marriage, and he does not now, as a matter of fact, seek to avoid them entirely. In a number of states it is required that the person who marries should be free of syphilis, and in a few states the prospective bride and groom must also be free of epilepsy, tuberculosis, and insanity. One state adds alcoholism, drug addiction, and feeble-mindedness to the list of things which are officially recognized as making a man or woman unfit for marriage.

Public health, furthermore, is intimately concerned with the family, not only from the point of view of physical health, of the contact spread of infections or the parents' coöperation in immunization of children, but also from the point of view of the family's social and biological stability. Today a considerable amount of investigation deals with family size and composition, parent-child and other family relationships, and the social-economic characteristics of families rather than individuals. New departures in statistical and epidemiological analysis are resulting from the increasing necessity of dealing with the family as a population unit.

Since marriage is so important an event in the social and biological history of the population, its record is, *ipso facto*, a part of vital statistics. A divorce

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record, marking the termination of a marriage, is also for the same reason a part of vital statistics. Complete and accurate marriage and divorce records should accordingly be available in every state vital statistics office, and they should be in the custody of the vital statistics registrar. The reasons for this are numerous and varied.

An official record of a marriage or a divorce may be needed at some time by every individual. The large number of urgent inquiries we receive in the Census Bureau from persons trying to trace marriage or divorce records is a convincing demonstration of this need. And the frequency with which our serious efforts to help fail because the person does not know or cannot remember where the county or other local record is filed, is sufficient proof that a centralized file in each state is essential for filling the need. This experience is duplicated in probably every state vital statistics bureau.

An acceptable proof of marriage or of divorce is needed more today than ever before. Such proof has always been required in relation to questions of legitimacy and parentage, and in insurance claims and the settlement of estates, but now the social security program, public relief, workmen's compensation, and at this moment, conscription, may all demand at some stage in their operation proofs of marriage or of its termination.

From the point of view of the state, the individual's marriage or divorce record has not only the primary value of defining his family relationship, but also the equally important function of evaluating him as one element in the population for the purpose of investigating a number of basic problems. The state needs to know in some detail how its population is growing. Adequate study of fertility requires knowledge of the ages at which males and females marry and the proportions of their re-

spective age groups which the marrying persons of both sexes represent.

The age at marriage depends upon a number of factors. It is determined by cultural traditions, which vary with racial or ethnic groups, with differences in climate, and with urban and rural modes of living. It depends also on economic circumstances and varies widely among social classes. Fertility, on the other hand, may vary with these factors independently of age at marriage, a circumstance which can be studied only when knowledge of age at marriage, in relation to these factors, permits the age factor to be held constant.

The changes that are known to be taking place in the composition of our population and the large effects these changes are likely to have on the nation's future economic and social development, make the relations of marriage statistics to these problems worth first consideration. But their use is not confined to these matters. The study of marriage as a basic economic and social factor receives, or should receive, the attention of a number of different groups and interests, among them certain governmental agencies, industrial and commercial organizations, religious bodies, social welfare agencies, and the courts. In market studies by governmental and industrial analysts, housing needs, commodity consumption, and agricultural and industrial production are measured by and related to family units. The church is concerned with initiating and maintaining the stable family as the fundamental unit in the social structure. Welfare agencies handle most or all of their problems on a family basis. Certain kinds of courts are concerned with the evasion of marital and family responsibilities or with the termination of marriage.

To all these interests the present and future trends in marriage and divorce rates, particularly in regard to their

economic, social, and racial or other ethnic relationships, are of primary importance. Such lack of interest as may exist at present is due largely to the absence of the necessary data by which these trends may be measured.

Today we do not know how many marriages and divorces occur in the United States each year. The only nation-wide marriage and divorce statistics that have been tabulated are the number of marriages per year, and in a few limited details the number of divorces per year, by state and county, from 1867 to 1932. Even during this period of only 66 years, two intervals totaling 14 years are covered only by estimates. Since 1932 no official marriage or divorce statistics of any kind have been collected or tabulated for areas larger than states, and the only figures we have to represent this recent period are estimates of total numbers of marriages and divorces in the United States from 1933 to 1937.

The principal reason why these statistics have been so badly neglected is probably the fact that for a large part of the country records of marriages and divorces are not readily accessible. Although the situation has been slowly improving during the past few decades, there are in the United States many hundreds of separate dissimilar systems of filing marriage and divorce records.

A few details are worth stating: 20 states do not collect marriage records centrally, and 32 states are without a central reporting system for divorces. In these states the records are to be found only in county or other local offices, and often under antiquated and inadequate systems of recording, filing, and indexing. For these states marriage records are scattered in nearly 1,600 separate independent and unrelated files, and divorce records in about 2,100. Individual records in these files are usually not traceable unless both the state and county in which the marriage oc-

curred or the divorce decree was granted are known.

Of the 28 states in which records of marriages are received in a central state office, in only 10 are the original certificates filed. In the remaining 18, complete or partial copies of these certificates are returned to state offices. Among the whole group of 28 states the types of records vary greatly in the amount of useful data they contain.

From the purely practical point of view it is the difficulty of collecting non-centralized records which presents the largest problem in gathering the marriage and divorce statistics of the country. Lack of uniformity in state marriage and divorce laws, a frequent disregard of the requirements for good registration, and diversity in the form and content of records also contribute to the problem; but the biggest factor is the absence in many states of centralized collection of records. Establishment of this is difficult, usually requiring action by the state legislature, but once the system is set up it is possible to do something about improving the method of registration and the type of record.

As regards registration, the term should properly denote a system whereby original certificates or other original records are deposited in permanent archives. Under existing conditions, such a system, where it does not now exist, can be more readily instituted for marriages than for divorces. The filing of marriage certificates, though not often centralized, is a more or less established practice, whereas, the filing of divorce certificates seems not to be a practice at all. By a divorce certificate, I mean not the decree but a separate official record which contains, in addition to such facts as cause, type, and date of the divorce, the personal particulars necessary for adequate demographic identification of the parties. Such a certificate should be filed, and prefer-

ably prepared, independently of the usual court record.

The demand for national marriage and divorce statistics has been widespread and insistent for a number of years. The Bureau of the Census has sought to resume this work since its discontinuance in 1933. The opportunity to reinvestigate the nation's marriages and divorces has come in connection with the Sixteenth Decennial Census. The work has properly been made a part of the activities of the Division of Vital Statistics, where it is being developed with a view to making it a permanent continuing function, supplementing the division's work in birth and death statistics.

The aim of the bureau is to set up marriage and divorce registration areas. By this procedure the fact that the collection is not nation-wide is, under present conditions, an advantage rather than a handicap. The reasons for this point of view are found in the history of the collection of birth and death statistics. The birth and death registration areas were small at first, but grew steadily, and after a time comparatively good birth and death data were being obtained from the whole country. One of the principal reasons for this success was the fact that the birth and death registration areas were defined according to certain standards of completeness and accuracy of data. This attracted the coöperation of states with the best birth and death records, and tabulations of the vital statistics of these states encouraged other states to take such steps as would make them eligible for admission into the registration areas.

The whole program of the new marriage and divorce work is being developed with the thought of having it proceed in the same way. Marriage and divorce registration areas can be established at any time that the bureau is assured of receiving the funds necessary to continue the work on an annual

basis. We hope to be able to define these registration areas on the basis of the first year's returns.

The present collection and tabulation of marriage and divorce statistics in the Census Bureau is to be carried on during the current Census period which runs through 1942. The work is now well under way; the bureau is receiving transcripts of the 1939 marriage and divorce records of most states where they are available from a central office. The bureau will attempt to collect the records of 1939, 1940, and 1941, in order to obtain marriage and divorce frequencies over a period centering around the 1940 Census enumeration, so that average frequencies may be used for rates.

According to present plans we shall make separate tabulations for each of the states from which marriage and divorce data are being collected. This will permit varying the details of tabulations in accordance with differences in amount of information to be supplied by different states. For example, a state which can supply data only on age, race, and residence for marriages, will be represented by a report in which only these items are tabulated, but in such combinations and as great detail as seems warranted. For another state which gives most of the data called for on the transcript form, there will be tabulations comparable with those of the state with limited data, and also such others as the additional data make possible.

Although the current collection of marriage and divorce records will not include those of a number of states, the detailed statistics that we shall be able to tabulate will probably yield certain types of information which can be considered as applicable to the country as a whole. For example, the age distribution of white females who married in 1939 among 28 well scattered states, is very likely to be the same proportional

distribution as would be shown for this group by the country as a whole.

An interesting and fortunate circumstance is the fact that we shall receive the marriage data of a solid block of 13 states in the northeastern section of the country from Maine through Virginia and West Virginia. Not only does this area contain a large proportion of the nation's population, very nearly one-third, but the fact that all of the included states are sending in transcripts of their marriage records means that any serious problem of handling migratory marriages within the area will not arise.

Moreover, every state contiguous to these has some statutory provision, requiring either a waiting period or a pre-marriage physical examination, which tends to deter migratory marriages.

Accordingly, tabulations covering the whole of this group of northeastern states, whose records are for the most part very good and detailed, should provide marriage statistics of a kind that have not been possible in the past, and in which the problem of residence reallocation can be readily handled. Such consolidations of the statistics for groups of contiguous states will be pos-

sible also in other sections of the country.

For the present, of course, there will be certain limitations and difficulties in the compilation of tables and the interpretation of data, as a result of the incomplete collection of records. Every aspect of the work, however, is aimed at the possibilities for the future, and these offer considerable promise. A number of states whose marriage and divorce records are not centralized are now taking steps to bring this about under the incentive of the Census Bureau's new interest, and there are other convincing indications that the registration areas, if set up now, will grow rapidly.

Of considerable significance to the further development of national marriage and divorce statistics is the present wide interest in the Model Vital Statistics Act. The act, which gives full recognition to marriage and divorce records as part of vital statistics, represents the best and most desirable means for attaining centralization of records and uniformity in registration and record forms. Adoption of the act by all states would mean solution of most of the problems which now hamper state registration of records and national collection of statistical data.

Comparison of Undechlorinated and Dechlorinated Swimming Pool Waters*

24 and 48 Hour Plate Counts of Samples

THOMAS M. RIDDICK, M.S.C.E., F.A.P.H.A.

Consulting Engineer and Chemist, New York, N. Y.

IN the summer of 1934, bacteriological analyses of samples from seven of the large commercial outdoor swimming pools in New York City revealed little correlation between high 24 hour counts and the incidence of coliform bacteria.

It was also observed that the 24 hr. readings were erratic but that after 40 or 48 hr. the colonies developed to a size which enabled easy and accurate enumeration.

Since 1935 both 24 and 48 hr. counts have been made on all swimming pool samples, and pH, chlorine residual at the point of sampling, and the actual number of bathers in the pool water have been carefully recorded. The latter is the only satisfactory method for measuring bathing load. Total attendance has little significance since it also applies to the pools' sand beaches and playgrounds.

The following swimming pools in the New York City metropolitan area have been supervised by the writer: Bronx-dale, Castle Hill, Farragut, Jerome, Metropolitan, Miramar, Riverside, and Riviera. In general, capacities are about 450,000 gallons; size, 75 x 150 ft.; and all sterilize with ammonia and chlorine,

with the exception of the Miramar Salt Water Pool, which uses chlorine alone. The Castle Hill Pool has a uniform depth of 8 ft. (as contrasted to normal sloping bottoms) and is about twice the average size. Vacuum type chlorinators are installed at all pools, except Jerome and Riverside. Castle Hill and Farragut have direct feed ammoniators. The other pools mentioned feed both chlorine and ammonia by improvised solution type drip feeders. Bronx-dale, Jerome, Riverside, Riviera, and Miramar use New York City water—Miramar adding rock salt. Farragut employs well water and Castle Hill and Metropolitan use brackish Long Island Sound water.

Rates of filtration average about 3 gal. per sq. ft. per minute, and turn-overs average about 8 hrs. One notable exception is the Farragut Pool which operates at a 5 gal. rate but, from the standpoint of sterilization, this is offset by the exact control provided by a vacuum chlorinator and a direct feed ammoniator. Normal capacity bathing loads are about 400 persons in the pool water at any given time, which represents a gross attendance during the operating day of about 4,000. Extreme peak loads, occurring only a few days each season, are about 800 bathers.

Two collections (of two samples each) are made weekly on good weather

* Read before the Engineering Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

days (1:00–5:00 P.M.) and sampling points are alternated between the opposite sides and ends of the pool.

Since 1936 all samples have been dechlorinated with sodium thiosulfate, transported to the laboratory in an iced container (Thermos jar) and sown within 1 to 4 hr. A bacteria counter with magnifying glass and tabulator is used. Filtered nutrient agar (Difco) is employed and the incubation temperature is 37° C.

Since many state and city health departments have not adopted the A.P.H.A. committee recommendations, there exists a wide variation in bacteriological standards for swimming pools. For instance, the New York State regulations (revised to May 31, 1940) allow 500 colonies per ml. (24 hr. 37°) in 10 per cent of the samples, whereas,

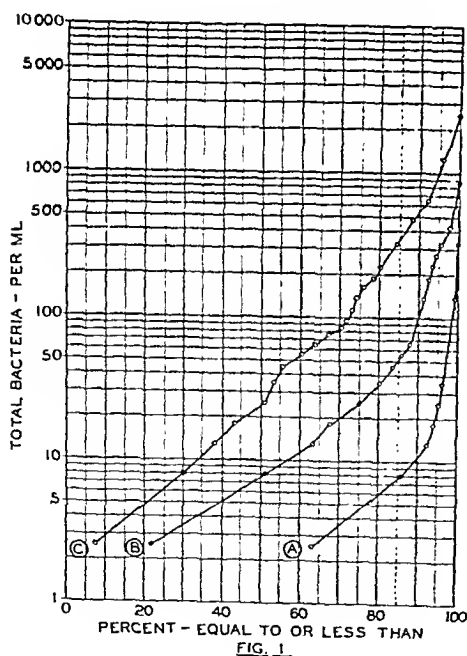


FIG. 1.—Comparison of duplicate collections
184 Samples—4 Pools—1935
A = 24 hour count—samples NOT dechlorinated
B = 24 hour count—Samples dechlorinated
C = 48 hour count—Samples dechlorinated

the A.P.H.A. standards allow only 200 in 15 per cent of the samples.

A uniform standard for recirculating type pools should be adopted and applied as universally as the U. S. Treasury Department Standards for Drinking Water. The legal aspect created by divergent standards can be embarrassing to the plaintiff as well as to the defendant.

Although dechlorination of swimming pool samples was not officially required until the summer of 1936, it had been advocated prior to that time.

During the 1935 season, the New York City pool owners graciously permitted (for comparison) the collection of both chlorinated and dechlorinated samples from the same sampling point.

Results of these analyses are presented graphically in Figure 1. Individual bacteria counts were grouped 0–5, 6–10, . . . , 100–125, . . . , etc., and the totals of these groups were plotted as cumulative per cents of the total number of samples. This gives a type of duration curve easily interpreted. Curve "A" shows 24 hr. counts of 92 samples not dechlorinated.

70% (64 samples) had a total count of 3–4, or less

80% (74 samples) had a total count of 6, or less

90% (82 samples) had a total count of 11, or less

100% (92 samples) had a total count of 350, or less

The 85 per cent line is dotted for ready comparison with A.P.H.A. standards, which state that not more than 15 per cent of the samples shall have a total count greater than 200 (24 hr. at 37° C).

Of the undechlorinated samples, only 15 per cent had total counts of greater than 8, compared with the allowable value of 200 per ml.

The effect of dechlorination is shown in curve "B" which crosses the 85 per

cent line at 52. Dechlorination therefore raised the 24 hr. count 650 per cent.

Curve "C" gives 48 hr. counts of the dechlorinated samples. The value of 52 was raised to 340, or an additional 650 per cent.

Curve "B" definitely confirms the necessity for dechlorination, and curve "C" strongly indicates the advisability of changing the period of incubation from 24 to 48 hr.

In 1935 (as well as to date) the maximum allowable count permitted by the New York State Health Department (for 10 per cent of the samples) was 500. If seven commercial pools could maintain waters to give a total count of only 11 (90 per cent of the time), does it not suggest that they must have been exceptionally well operated, or, that the state's standards are perhaps too low?

Previous mention has been made of the lack of correlation between total 24 hr. count and an incidence of coliform bacteria, and the often startling increase (in total count) upon 48 hr. incubation. An extreme example of this tremendous rise is shown in Figure 2, which is an actual photograph of a swimming pool water sample giving a 24 hr. count of about 10 and a 48 hr. reading greater than 1,000. Intestinal



FIG. 2—Examples of low 24 and high 48 hour plate count (dechlorinated sample)

group organisms were found in this sample and it was difficult to reconcile the presence of coliform bacteria with such a low total count. The high 48 hr. reading justified the condition.

If all 48 hr. counts bore a definite ratio to the 24 hr. results, there would be no necessity for prolonged incubation. However, this is not the case. Some samples may increase less than 100 per cent, while others increase several thousand per cent.

TABLE 1

Summary of Increase in Bacteria Counts Due to 48 Hours of Incubation
171 Samples Containing Coliform Bacteria—7 Pools—1936-40

Group— 24 Hour Count	Number of Samples in Group	Per cent of Samples in Group	Number in Group Per cent Increase on 48 Hours Incubation							
			0-100	101-200	201-300	301-400	401-600	601- 1,000	1,001- 2,000	2,001- 4,000
0- 10	23	14	1	3	2	1	2	2	8	4
11- 25	38	22	4	6	7	4	3	7	4	3
26- 50	30	18	2	5	8	5	3	5	2	0
51-100	31	18	8	1	9	6	3	3	1	0
101-200	31	18	16	10	3	1	1	0	0	0
201-300	16	9	10	4	2	0	0	0	0	0
301-400	1	0.5	1	0	0	0	0	0	0	0
401-500	1	0.5	0	1	0	0	0	0	0	0
Total	171	...	42	30	31	17	12	17	15	7
Per cent	...	100	25	17	18	10	7	10	9	4

In normal surface and well waters most bacteria are derived from the soil and produce relatively large, quick developing colonies, whereas in pool water we have a large proportion of oral and skin types of bacteria which produce small, slow developing colonies. This is evident if samples of urine, sputum, and nasal mucus are sown.

Table 1 lists 171 dechlorinated samples which contained coli-aerogenes group organisms. These were collected from seven pools from 1936 to 1940. Fifty-one of the 171 samples (or 30 per cent) increased from 401 to 4,000 per cent upon incubation for 48 hr. This definitely shows the need for 48 rather than 24 hr. counts for swimming pool waters.

Figure 3 gives the relationship between 24 and 48 hr. counts of 500

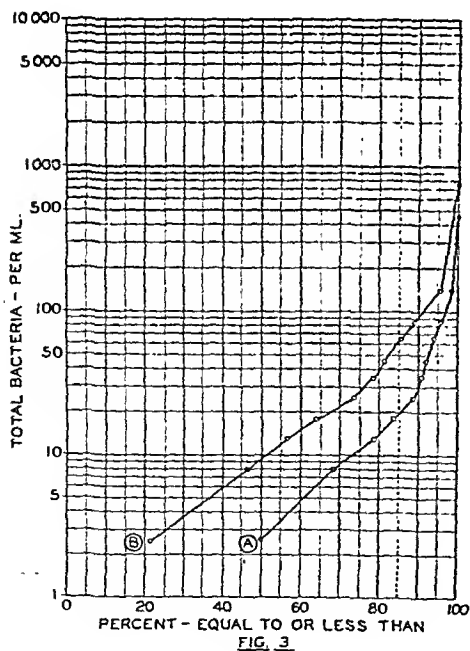


FIG. 3—Relationship between 24 and 48 hour plate counts of normal water samples
500 Routine Analyses: deep and shallow wells—streams—reservoirs—filtration plants, etc.
A = 24 hour count
B = 48 hour count

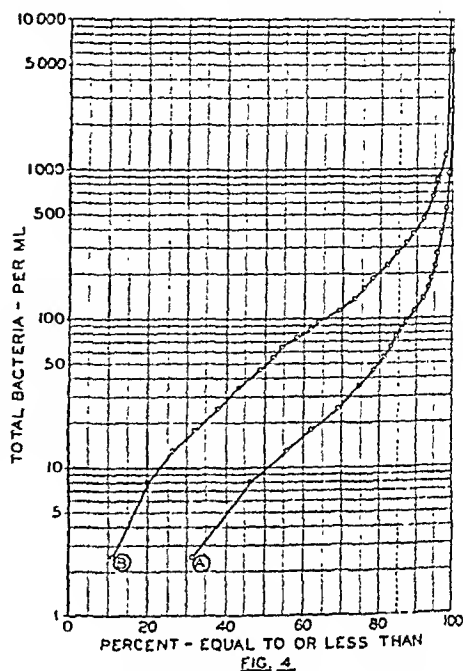


FIG. 4—Comparison of 24 and 48 hour plate counts
1,600 dechlorinated samples—7 pools
—1936-40
A = 24 hour count
B = 48 hour count

routine water analyses—swimming pools excepted.

The 24 hr. count of 5 increased to 15, or $3X$
The 24 hr. count of 10 increased to 25, or $2\frac{1}{2}X$
The 24 hr. count of 20 increased to 63, or $3X$

Figure 4 shows the relationship between 24 and 48 hr. plate counts of 1,600 dechlorinated samples of swimming pool water.

The 24 hr. count of 5 increased to 30, or $6X$
The 24 hr. count of 10 increased to 50, or $5X$
The 24 hr. count of 20 increased to 100, or $5X$, etc.

In other words, the increase in total count of swimming pool waters due to 48 hr. incubation is from $1\frac{1}{2}$ to $2X$ that of normal well and surface waters.

Figure 4 also shows the increase that can be anticipated if the 48 hr. count were adopted to replace the 24. During these 5 years of swimming pool opera-

tion, 85 per cent of the samples had a 24 hr. count of 80, as compared with the A.P.H.A. limit of 200. Ninety per cent had a total count of only 110, as compared with the New York State limit of 500. Obviously then, these pools from the standpoint of total counts, operated far better than minimum state and A.P.H.A. requirements.

Bacteriological standards for swimming pool waters cannot be established by epidemiological evidence, which is difficult to obtain, although certain authorities are definite in their conviction that disease may be transmitted by swimming pool waters, and I see no logical reason to the contrary.

The bacteriological standard must be set by permitting a total count and a concentration of intestinal group organisms that is consistent with careful, uniform, and efficient operation.

The bacteria count is simply an indication of the care exercised in pool operation and the efficiency of filtration, sterilization, etc.—just as a bacteria count of less than 30,000 represents careful production, handling, and sterilization of grade A pasteurized milk.

From Figure 4 we see that 85 per cent of the New York City commercial pool samples had a total 24 hr. count of 80, or 40 per cent of the allowable limit set by A.P.H.A. standards. If we apply this factor to the 48 hr. count (275), the allowable limit would be

increased from 200 to about 700. The present standards impose no undue hardship on pool operators. A 48 hr. limit (for 85 per cent of the samples) of about 500 would, I believe, be generally acceptable and at the same time would not permit careless or inefficient operation.

Table 2 shows coliform bacteria present in 1,165 samples from six pools for the years 1937 to date. The per cent of samples confirming for these years was 19.1, 11.7, 14.0, and 16.6, respectively.

From the standpoint of coli-aerogenes group organisms, the quality of these pool waters for 1937 and 1940 was below the allowable limit set by the A.P.H.A. standards. They specify that not more than 15 per cent of the *samples* shall show the presence of coliform bacteria in *any* of five 10 ml. portions.

From the standpoint of total count, we have seen that these pools operated well within the standards. Is it not evident that "intestinal group" standards are too severe, or, that "total count" standards are too lax? The former would appear to be true, since for all four years the per cent of *portions* confirming was less than 10 per cent, or, in other words, the pool water would have passed the U. S. Treasury Department Standards for Drinking Water. Also, these samples would have come well within the New York State

TABLE 2
Summary of Incidence of Coliform Bacteria
1,165 Dechlorinated Samples—5 Pools—1937-40

Season	Total Number of Samples	Number of Samples Confirming	Number of Portions Confirming	Per cent of Samples Confirming	Per cent of Portions Confirming
1937	371	71	153	19.1	8.2
1938	317	37	116	11.7	7.3
1939	308	43	83	14.0	5.7
1940 *	169	28	80	16.6	9.5
Total	1,165	179	437	....	...
Average	291	45	109	15.3	7.5

* To Aug. 15.

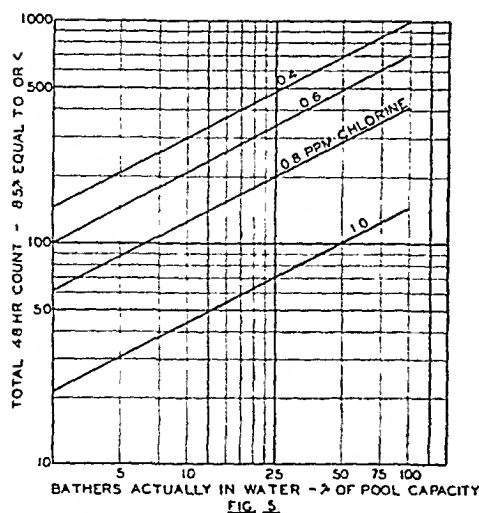


FIG. 5—Relationship of bathing load chlorine residual and 48 hour bacteria count
1,000 dechlorinated samples—6 pools
—1937-40

Health Department regulations, which permit the confirmation of two of five, or, 40 per cent of all *portions* sown.

The coliform bacteria standard should be changed to not more than 15 per cent of the *portions* instead of 15 per cent of the *samples*.

The relationship of bathing load, chlorine residual, and total 48 hr. bacteria count is shown in Figure 5. The curves were approximated by correlation of about 1,000 samples and then smoothed out. It should be borne in mind that the bacteria count is not average but represents the 85 per cent value. For example, a 400,000 gal. pool is assumed to be operated at full capacity when there are 400 bathers *actually in the water*. This is 1,000 gal. per bather and checks with what pool operators in New York City consider a "full pool." Suppose in such a pool the bathing load were 200, or 50 per cent. Then if a residual of 1.0 p.p.m. were maintained, 85 per cent of the samples would have a 48 hr. count of 100 or less. If the chlorine content was 0.8 p.p.m. at this load, the total (85 per cent) count would be about 275.

When a pool is operated at 100 per cent capacity, the chlorine should be about 1.0: at 50 per cent capacity, 0.9—at 25 per cent capacity, 0.8—at 10 per cent capacity—0.6, etc., if present A.P.H.A. standards (200) are to be met and plate counts are to be 48 rather than 24 hr. The need for 48 rather than 24 hr. incubation was obvious in the construction of this graph. A definite correlation was found to exist for 48, but little for 24 hr. plate counts.

Figure 6 shows 24 and 48 hr. counts of 177 dechlorinated samples (1936-1940) containing from 1 to 5 portions confirming as coliform bacteria. We find from these curves that there is correlation between total count and incidence of *Escherichia coli*. From Figure 4 (1,600 samples, some of which contained *Escherichia coli*), the 24 hr. count of the average sample (50 per

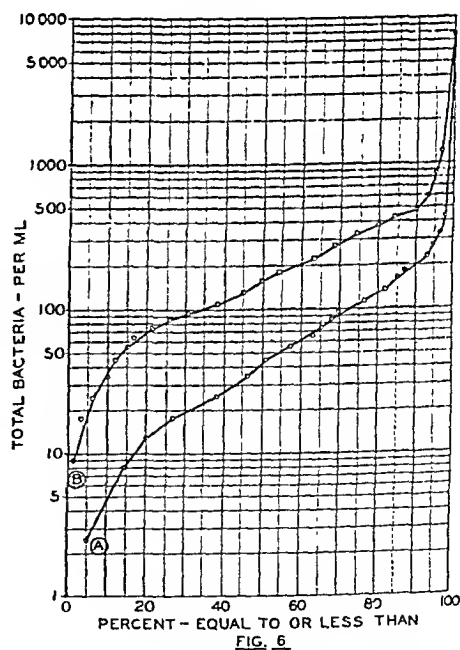


FIG. 6—Relationship between 24 and 48 hour plate counts of samples containing coliform bacteria
177 dechlorinated samples—6 pools—
1937-40
A = 24 hour count
B = 48 hour count

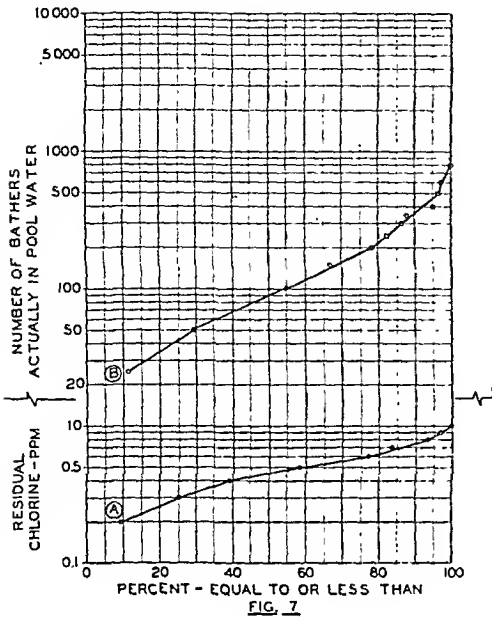


FIG. 7—Chlorine Residuals and Bathing Loads at times when coliform bacteria were present (1 to 5 portions confirming) 171 dechlorinated samples—6 pools—1937-40
A = chlorine residual
B = bathing load

cent line) was 10. Here it is 45. The average 48 hr. count of Figure 4 was 50—here it is 160. The same relationship applies to the 85 per cent line. Here the 24 hr. value increased from 80 to 160, and the 48 hr. value from 275 to 425. This indicates that coliform bacteria are associated with high total

counts, and, conversely, that the total count may be used as an index to control the incidence of intestinal group organisms.

Figure 7 shows chlorine residuals and bathing loads at the time of collection of the 171 samples containing intestinal group organisms. At 25 per cent bathing load (100 persons in the pool) the chlorine residual was 0.5; at 50 per cent, 0.6—at 75 per cent, 0.7, and at 100 per cent capacity, 0.8. The capacity was exceeded (greater than 400 in pool water) 7 per cent of the time. The incidence of coliform bacteria was in general due to too low a chlorine residual for the attendant bathing load.

CONCLUSIONS

1. The dechlorination of swimming pool samples is fully justified.
2. The 24 hr. incubation period should be increased to 48 hr.
3. Bacteriological standards should be modified as follows:
 - (a) Not more than 15 per cent of the samples analyzed should have a total count greater than 500 (48 hr. at 37° C.).
 - (b) Not more than 15 per cent of all portions sown should show the presence of coliform bacteria.
4. A reasonably definite relationship exists between total 48 hr. count, chlorine residual, and bathing load.
5. State, county, and municipal health departments should adopt a uniform bacteriological standard. This is particularly important from a legal standpoint.

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RECORDS OF MARRIAGES AND DIVORCES

IT is not good editorial policy to comment upon papers, as such, which appear in this or other journals. On the other hand, when a current article presents a matter of considerable importance, especially one that is somewhat off the beaten path of public health, it seems sensible to call attention to the significance of that subject. This preamble, then, is in reference to the desirability of developing a central repository of marriage and divorce records, the necessity of which is discussed elsewhere in this issue of the *Journal*.

Those who have had their perspective of public health frozen along conventional lines may be somewhat impatient of having records of marriage and divorce considered as of importance in their field of work. But such records are of the utmost importance if one sees public health in its broad implications. Vital statistics are, after all, but data which reflect the biologic happenings in a given population. In their barest outline, such data would set forth, only grossly, the numbers born and the numbers dead. However, even the old London bills of mortality made some distinctions as to cause of death and whether "within the walls" or "without the walls." Since then we have come a long way in particularizing our standard certificates of births and deaths, in the completeness of their collection, in the analysis of their contained data, in the care exercised in the storage of these records, and, of great practical importance, in their easy availability for reference and transcribing under proper safeguards. Thus, as time has passed they have become of increasing value, not only as social records, and not only as quantitative measures of racial profit and loss, but equally important is the fact that they provide, to some extent at least, a qualitative picture of the biologic happenings which they represent.

Students of sociology, of population, of fertility have long insisted that vital statistics could not be placed in proper perspective without a more comprehensive knowledge of marriage and divorce. One might disagree with this on the grounds that these two institutions or procedures are social rather than biologic, that really they are but conventions, acting in many instances as biologic brakes. To a limited extent such contentions would be true, but not of significance if it is

borne in mind that, with the exception of the very small proportion of births which occur outside wedlock, marriage ordinarily initiates the beginning of purposeful mating, while a decree of divorce indicates that reproduction as a collaborative function of the particular pair concerned is at an end. Marriage and divorce, therefore, in terms of potential births and in relation to fertility and fecundity, have definite biologic implications, and records of them constitute an important part of the broad subject of vital statistics. That such records should be available and utilizable, and utilized, as are birth and death certificates, is a goal properly to be sought in the interest of the public health. State and local health authorities and those in related fields should lend their sincere assistance to the Federal Bureau of the Census in this undertaking. That health organizations rather than courts and other civic agencies are leading in this effort will tend to confirm the public's beginning awareness that health agencies do about as much constructive and foresighted thinking as any institution of government—if not more.

THE INEVITABLE EDITORIAL ON VACATIONS

BY now many will have returned from vacation, some will be in the process of enjoying or suffering this annual absence from regular work, and to still others the seashore or the mountains or the lakes will continue to beckon. Where one goes, what one does, and the benefits or lack of benefits that one achieves will naturally vary with personalities, tastes, and pocketbooks. To this man, a vacation means nothing more than sunburn, insect bites, and poison ivy; to another, it brings rather complete mental relaxation, a peace of mind from which has been erased the worry of a daily grind's petty details.

Perhaps the most unfortunate and unwise kind of vacation is the one taken in dribbles; a series of long week-ends, where in the office or field a hectic attempt is made each Thursday or Friday to finish up certain things that must be done. Then follows a last minute rush for a train, or a high pressure drive to join the family or friends who are taking their ease at Sandy Key or Mountain Retreat. The few days that one is there are not sufficient to permit adjusting to a new routine, and strangely cooked eggs, unlooked for mattress lumps, and bathroom competition are likely to loom larger than they would after a week or so. Further, on this interrupted type of vacation, the day for return to work presses so hard upon the day of arrival that all plans must be in terms of tomorrow or at most the day after. And then back to the job to meet problems which, had they been left to simmer for a week or so, would spontaneously have gone into solution.

No, the fitful vacation is not to be recommended. Take all the time off you can get, and all at once, bearing in mind particularly that with the present unsettled state of affairs this may be your last vacation for a long time to come. Play golf, or climb mountains, or swim, or fish, or do nothing, as suits you. Exhaust yourself physically if such exhaustion is incident to something in which you are interested or which gives pleasure. But above all, do not work at unfinished business. You may of course accomplish something in this way, but the fact that you do is pretty good evidence that the vacation has not been beneficial, and for this reason: the real criterion of a holiday period is whether or not the individual gets so far away from his daily chores that he begins to wonder if he ever did possess competence to do the things called for in his work.

This is the first stage of relaxation, when the mind has drifted gently away from statistics and epidemiology, when the health officers' administrative procedures, the nurses' technics, and the health educators' reference frameworks are sinking into the limbo of the unimportant. Then comes the second stage of vacation psychology, when toward the end of the period new approaches to old problems rise spontaneously in the mind, when thoughts of getting back to the job have a new savor, and one's strength seems as the strength of ten because the mind is pure—or reasonably so. Thus one comes to the end of a perfect vacation, in the first stage having been psychologically purged of the cares that infest the day, and in the second stage, refreshed, alert, and renewed in mental muscle.

The Editor has not yet reached the second stage.



*Atlantic City, N. J., Skyline
Seventieth Annual Meeting
October 14-17, 1941*

BOOKS AND REPORTS

Vital Statistics of the United States, 1938 — *Washington: Government Printing Office*, 1940. Part I, 583 pp. Price, \$1.75; Part II, 205 pp. Price, \$1.25.

The tremendous task of analyzing in tabular form the vital statistics of a nation of one hundred and thirty millions has been accomplished with clarity, judgment, and scientific accuracy. Part I presents detailed tables of live births, stillbirths, and deaths according to place of occurrence; Part II presents a more limited set of tables of births and deaths allocated to place of residence of the mother or decedent.

The publication of resident data was commenced in 1937. That correction for residence is essential will be seen from the fact that in 1938 "non-resident" deaths numbered 174,000, or 12.6 per cent of the total mortality, while "non-resident" births, 362,000, represented 15.8 per cent of all births recorded in this country. For many cities and rural areas the *recorded* birth and death rates, and even in greater degree the *recorded* death rates from certain causes, are fallacious and dangerously misleading.

Following a close examination of this excellent publication, the reviewer wishes to make this friendly comment:

1. Institutional mortality is much greater than that among the general population, and therefore the practice followed in the report of charging all deaths in "resident" institutions to the communities in which they are located introduces a greater error than that which would result from the allocation of the deaths without a corresponding redistribution of the inmate population. Here is an example that will illustrate

this point. According to the report, Suffolk County in New York had 3,328 resident deaths in 1938, of which 1,509 occurred in resident institutions. The allocation of the deaths, but not of the population, of these institutions produces a death rate of 11.8 for the county exclusive of the institutions. If both the population and the deaths in these institutions were excluded, the resident rate of the county would be 10.8. A rate based on the figure given in the report (17.5) would overstate the "true" resident rate by at least 48 per cent

$$\left(\frac{17.5 - 11.8}{11.8} \times 100 \right).$$

2. The second part of the report devotes 59 pages to Births by Person in Attendance; and Deaths by Institution: Each State, County, and City. The value of this information is decidedly local; for a national audience a one or two page summary by states, and perhaps their urban and rural subdivisions, would seem sufficient. The space gained could be used to great advantage for the presentation of resident rates complementing the recorded rates in Part I, and for a subject index.

J. V. DePORTE

Biological Aspects of Infectious Disease—*By F. M. Burnet, M.D. New York: Macmillan*, 1940. 310 pp. Price, \$3.75.

It is a pleasure to greet this little book on infectious diseases, written from the viewpoint of a medical biologist. The value of the approach is convincingly presented in the introductory chapters, entitled respectively "The Ecological Point of View" and "The Evolution of Infection and Defence."

The succeeding discussions in Part II, "The Aggressors," and in Part III, "The Processes of Defence," necessarily ring a more familiar note. In a following section the author outlines the more important factors which determine the natural distribution of infectious diseases, the character of epidemics, and the general principles of control. He then illustrates by sketching the epidemiology of diphtheria, influenza, tuberculosis, plague, cholera, malaria, and yellow fever. The reader is somewhat disappointed, however, that the ecological approach has not been more effectively maintained in his considerations of these seven diseases. The epilogue appropriately concludes with a discussion of "new" diseases and the outlook for the future, emphasizing the dynamic character of disease patterns in a turbulent world. To a physician, a medical student, or a non-medical reader with a broad interest in human biology, this book offers a stimulating and readable general survey of the field of epidemiology.

KENNETH F. MAXCY

Medicine and Human Welfare—
By Henry E. Sigerist. New Haven: Yale University Press, 1941. 148 pp. Price, \$2.50.

Dr. Sigerist has the distinction of being a recognized authority in both medical history and medical economics. In this book, the published version of the Terry lectures delivered at Yale, he combines these two fields in a timely essay which sketches the relationship between man and his health from the dawn of Western Civilization to the present war.

The principal emphasis is placed upon the shift from a purely individual responsibility for health and disease to one which is increasingly being assumed by society. The author points out that health is now considered a public right while once it was the privilege of

the few. But even now many people are prevented from achieving real health by adverse living and working conditions. Economic circumstances often prevent the physician from reaching the persons who need him most. Physicians must therefore be concerned today not merely with the illnesses of individuals but with the whole social structure which, in the long run, determines health.

From these circumstances, Dr. Sigerist derives a conclusion which many physicians are not yet ready to accept but which he feels will ultimately be to their advantage: that all medical functions should be public functions.

The book is somewhat restricted on account of the brevity necessitated by the lecture form—one wishes for more extensive evidence in many places. It is, however, a readable and engaging presentation, illustrated with a number of interesting photographs.

DEAN A. CLARK

The Avitaminoses—*By Walter H. Eddy and Gilbert Dalldorf (2nd ed.). Maryland: Williams & Wilkins, 1941. 519 pp. Price, \$4.50.*

So rapid has been the progress in the science of nutrition in the last few years that a book on the subject that is more than two years old is likely to be quite out of date in many of its sections. This second edition of Eddy and Dalldorf, published in February, 1941, follows its first edition by only 4 years. Within those 4 years nicotinic acid has been established as a cure for human pellagra; the chemistry of vitamin K has been unfolded, and its function in human physiology has been established; the synthesis of vitamin B₁ has been accomplished, this following closely on the establishment of its chemical formula in 1935 and 1936; vitamin E has become alpha-tocopherol and this together with the newer vitamins pyridoxine (B₆) and pantothenic acid (filtrate factor) has become the source of

much speculation as to their usefulness in human nutrition.

For the busy practitioner or health officer a guide book to this bewildering and expanding science of nutrition is needed. For a general view of the field of the vitamin deficiency diseases this book can be readily recommended. The chemical background is not overemphasized and is largely collected into a single chapter near the start. The nature and function of each of the vitamins is taken up in a separate chapter with a surprisingly concise statement of the history of its discovery and use. This is followed in each instance by a longer chapter on the clinical and pathological features of the particular clinical disease. With the very useful (but incomplete) bibliographies that follow each chapter, material is thus in hand for a satisfactory understanding of the subject.

D. F. MILAM

Community Hygiene—By L. B. Chenoweth and W. R. Morrison. New York: F. S. Crofts & Co., 1941. 317 pp. Price, \$2.60.

In the preface, the authors state that they hope this volume may fill a need in colleges for a textbook in some of the broader aspects of hygiene. This it may well do, providing the general college student with an outline of the principal considerations in community hygiene. The insertion of the historical background of some of the diseases and procedures will undoubtedly hold the student's interest in the subject matter. However, as an accurate and current reference to the problems of community hygiene, the book leaves something to be desired.

This book will probably not seriously interest the critical students of public health in community hygiene. In the interest of brevity, the authors appear to have been forced to be rather dogmatic in some of their statements bearing on controversial subjects; and inas-

much as the publication date is 1941, it would seem that the edition would have been improved if more recent tables, charts, and references could have been used in a number of instances.

The general style and arrangement of the book is satisfactory. It will probably serve the purpose for which it was designed.

DONALD G. EVANS

Population, Births, Notifiable Diseases, and Deaths, Assembled for New York City, New York. 1866-1938, from Official Records—Planned by Haven Emerson, M.D. Executed by Harriet E. Hughes. New York: DeLamar Institute of Health, Columbia University, 1941. 406 tabulation sheets.

This volume is an abstract of the vital statistics from a long series of annual, monthly, and weekly reports for New York City, as well as those from official but unpublished records of the Department of Health. Experience in the use of the original published and unpublished material over a series of years impressed upon the authors the desirability of assembling these records in a more accessible and systematic form. The present volume fills this need and is dedicated "to the convenience of students and teachers of public health."

The volume includes five basic tables titled as follows:

Population by sex and age groups, for federal census years and estimated for intercensal years, 1860-1930

Births, by sex and color, by months, except for 1918, and by sex since 1934

Births, stillbirths, deaths under 1 year, and deaths under 5 years of age, by sex

Deaths, all causes, by sex and age groups

Deaths, by cause, by sex and age groups, and for certain diseases also cases and deaths by weeks or by months

Since these titles do not fully do justice to the content of the tables, a more complete description will be given.

The population table subclassifies sex under age throughout the series of years, and the basic age groups are single

years up to age 5, 5 year groups to age 85, and 85 and over. Although this is the basic grouping, for a number of years it was necessary to combine some of the age groups, the most frequent condensation being the tabulation of age 1-4 as a single group, and ages over 35 in 10 year groups. For the most part, the arithmetic method of estimate for intercensal years was used.

The second table classifies births by sex and by color under calendar month, but does not subclassify sex and color. This basic classification is complete for the years 1867-1880, 1891-1917, 1919-1934, and is partially complete for the other years. The third table, giving births, stillbirths, deaths under 1 and under 5, subclassifies these items according to sex, and covers the years 1870-1938.

Deaths, all causes, are cross-tabulated by age and sex, the age groups being those described in the population table. The table covers 1866-1938.

The bulk of the volume is taken up with the fifth table on cause of death. *The International List of Causes of Death* (1929 Revision) was used, regardless of the year of the experience, adjustments having been made to approach comparability after the period of years. The tables are divided into the fifteen groups of the *International List*. The years covered by the different causes necessarily vary somewhat, but in most cases the tables run back to 1866. The basic tables give the deaths cross-tabulated by age and sex. Additional tables on weeks of the year are included for certain causes.

In the introduction by Dr. Emerson, a discussion of the material is given and certain precautions are stated. Thus, changes in completeness of reporting, discrepancies in annual and monthly reports, and errors in diagnoses are discussed. It should also be remembered that the tables give recorded and not resident births and deaths. A study

of the volume indicates that an immense amount of work has been done in preparing these tables, and students of this material will have every reason to be grateful to Dr. Emerson and Miss Hughes for making it so readily available.

LOWELL J. REED

Feeding Our Old Fashioned Children—By C. Anderson Aldrich, M.D., and Mary M. Aldrich. New York: Macmillan, 1941. 112 pp. Price, \$1.75.

"To provide a background—to establish the fact that there is a mechanism for eating and to show how life in a modern household is likely to interfere with it," is the aim of this little book, according to its authors. To an unusual degree they have succeeded in doing what they set out to do. They give no diet lists nor feeding schedules but instead they give intelligent parents an insight into the physiological and psychological processes of the child which must be understood and taken into account if feeding is to be the normal and joyous process it was intended to be.

This book can be recommended unreservedly to all thoughtful parents for reading and rereading.

MERRILL E. CHAMPION

Personal Problems of Everyday Life—By Lee Edward Travis and Dorothy Walter Baruch. New York: Appleton-Century, 1941. 392 pp. Price, \$2.75.

The purpose of the book is to convey to the average intelligent reader the data and constructions developed in psychopathology. These are presented in reference to the emotional problems that beset the individual in his attempt to attain the life goals in the cultural setting in which he lives. It further gives the individual guidance in dealing with these problems, in seeking aid if he is unable to cope with the problems alone.

The authors carry their presentation through the problems that beset the individual in childhood, in adolescence, in marriage, in work and in play. They take their guidance chiefly from psychoanalysis. In carrying out their plan, they present scientific data and constructions, with few exceptions, without compromise to the popular purpose. When a compromise in the presentation is made, further reading corrects the wrong impressions. It would be desirable if the authors in their next edition eliminated these compromises and also if they presented more of the total personality and of the effects of the cultural environment. The former would show how disturbed functions in addition to historical determinants are maintained through intra-psychic and intra-human vicious circles; the latter how the individual's needs, ideals, and fears, are interwoven with his current environment.

The purpose of the book is worth while and the authors accomplish successfully what they set out to do. Thus, we have one of the rare books, expertly written in a popular style. It should have a beneficial and healthy effect on the average intelligent individual.

BELA MITTELMANN

Periodicity and Cause of Cancer, Leukaemia and Allied Tumours—*By J. H. Douglas Webster. Baltimore: Williams & Wilkins, 1940. 179 pp. Price, \$3.50.*

The author has made a gallant attempt to bring the clinical course of malignant disease into line with the cyclic phenomena so common in nature. The evidence presented is decidedly unconvincing. For example, in a discussion of cancer a small number of cases is presented in which the sudden shift in clinical course after a long latent period is offered as proof of periodicity. In the absence of recurrent periods of activity and inactivity at

regular intervals, it is difficult to understand the pertinence of the examples presented. This is particularly true since many of the patients were treated and the effect of treatment ignored in the consideration of the periodicity of the course.

Similarly, in a consideration of leukemia, the extraordinary variability of clinical course is advanced as evidence of periodicity. The fact of cyclic swing of clinical manifestations in this disorder is, of course, undeniable. On the other hand, the accepted periodicity does not correspond with the time intervals described by this author. He claims intervals of several months, whereas in the experience of most, the peaks of clinical activity rarely come more than four weeks apart. Furthermore, he ignores the effect of treatment as a factor which may cause alterations in the clinical course.

All in all, this type of publication is to be condemned. C. P. RHOADS

Introduction to Psychobiology and Psychiatry—*By Esther Loring Richards, M.D., Sc.D. St. Louis: Mosby, 1941. 357 pp. Price, \$2.50.*

This "text book for nurses" is really in three parts: (1) Its first two chapters are a rapid but quite thorough survey of the matrix within which psychobiology has had its setting. (2) The next four discuss "personality study material." They cover various topics of the autobiographic record which the nurse is urged to make. Dr. Richards insists that these records must not be made without good supervision and help. These chapters, amplified with lectures, would make an excellent basis for self-analysis that would not be morbid and which would bring out positive and worth while assets. (3) Half of the book discusses the various categories of mental illness (psychiatry). It emphasizes a "way of looking at" these phenomena instead

of a gnawing urge to give them names. No one can go through these two hundred pages without beginning to forget about psychoses and starting to think about those various ways in which certain sorts of people are working away at the problems of life.

While the whole book is written in simple and thoroughly understandable style (with sudden little flashes of simile that are much to the point), its content is very uneven. A paragraph directed to a none-too-academically minded pupil nurse is followed by one that is directed to the fairly sophisticated psychiatrist. The handling of the various actual difficulties (well, for instance, delirium) is beautifully done and gives the nurse the feeling that she can do the right thing and have some real notion as to why she is doing it. But there is certainly much that she will understand only with skillful interpretation.

Used as an outline for a fuller discussion (by a really competent person), this volume can play a magnificent part in getting nurses to understand themselves and their patients. Without that interpretation, the usual nurse will feel compelled to do considerable memorizing. This is the last thing that so sensible a psychiatrist as Dr. Richards would want—but the two types of material are too closely interwoven to allow any other course.

JAMES S. PLANT

The Doctor Takes a Holiday—
By Mary McKibben-Harper. Cedar Rapids, Iowa: The Torch Press, 1941. 349 pp. Price, \$2.50.

This is an excellent book for vacation reading, especially for those concerned with health promotion. The author carries you with her in a witty narrative as she travels from London, with a brief stay in Paris before embarking at Marseilles for the Orient. The reader is exposed to fun and frolic, poverty and

disease, as well as the efforts being made to relieve conditions in the major countries of Asia.

The effect of tradition and superstition is thoroughly recognized by the author but interpreted with tolerance and understanding. While deploring unfortunate conditions, she refers to situations in the United States which are also permitted to exist, though both the economic resources and knowledge are available to correct them:

Despite differences in eastern and western ideologies, some of the shocking customs and superstitions bear striking similarities to those of the West, while others appear to have a common origin. These similarities, rather than the more obvious differences, intrigued me and I returned fully persuaded that people are much alike, the world over.

Efforts to introduce scientific medicine and to encourage the application of hygienic practices are noted. Women physicians were sought out and their work is critically observed. (The Lady Hardinge Medical College for Women, at Delhi, is described in glowing terms: "... situated in a garden spot, an oasis of forty-five acres . . . and architecturally beautiful . . . the buildings . . . accommodate a hundred medical students and one hundred and fifty patients of different races and religions. . . . The operating room of the hospital . . . is the finest in the world, entirely staffed by women. . . .")

After a visit to Benares, "all pilgrimages are followed by epidemics the world over and the path of the health officer is beset with difficulties."

(Though the author is aware of weaknesses and inefficiency in national and local programs provided to raise the level of living and to promote the health of the peoples, plausible reasons for the failures are offered.) The work of women physicians impressed the author most favorably. "That women have a sympathetic insight, devotion and patience in medical work, has been wonderfully demonstrated in India."

Throughout the book the reader is shown beauty, the beauty of mountains, of plains, of sunsets, as well as of the great monuments of the world; of the Taj Mahal. "This first glimpse of the Taj satisfies one that he has been born for that moment . . ." Appreciation of beauty does not, however, lessen the author's awareness of health problems. "I forsook the pursuit of beauty

temporarily for an adventure in the study of leprosy."

Unfortunately, dates are not always given, so the reader is unable to decide whether some of the statements refer to before or after the world was thrown into its present state of chaos.

The realism and fairness with which situations are reported stimulate the imagination and furnish information.

SALLY LUCAS JEAN

BOOKS RECEIVED

FUNDAMENTALS OF HEALTH. By T. Bruce Kirkpatrick and Alfred F. Huettnner. Rev. ed. Boston: Ginn, 1941. 595 pp. Price, \$3.80.

OUTLINES OF INDUSTRIAL MEDICAL PRACTICE. By Howard E. Collier. Baltimore: Williams & Wilkins, 1941. 440 pp. Price, \$5.00.

SOCIAL CASE RECORDS FROM PSYCHIATRIC CLINICS. By Charlotte Towle. Chicago: University of Chicago Press, 1941. 455 pp. Price, \$3.00.

START TODAY! YOUR GUIDE TO PHYSICAL FITNESS. By C. Ward Crampton. New York: Barnes, 1941. 224 pp. Price, \$1.75.

EMPLOYEE TRAINING IN THE PUBLIC SERVICE. POLICIES AND PRACTICES IN PUBLIC PERSONNEL ADMINISTRATION. Chicago: Civil Service Assembly, 1941. 172 pp. Price, \$2.50.

PREPAYMENT PLANS FOR MEDICAL CARE. By Franz Goldmann. New York: Medical Administration Service, 1941. 60 pp. Price, \$.25.

FAMILY LIVING AND OUR SCHOOLS. By Bess Goodykoontz, *et al.* New York: Appleton-Century, 1941. 468 pp. Price, \$2.50.

THE PRINCIPLES OF DAIRYING. By Henry F. Judkins and Merrill J. Mack. 3d ed. New York: Wiley, 1941. 315 pp. Price, \$3.00.

PHYSICAL EDUCATION FOR SMALL ELEMENTARY SCHOOLS. By Harold K. Jack. New York: Barnes, 1941. 184 pp. Price, \$1.60.

FOOD ANALYSIS. TYPICAL METHODS AND THE INTERPRETATION OF RESULTS. By A. G. Woodman. 4th ed. New York: McGraw-Hill, 1941. 607 pp. Price, \$4.00.

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASES. Course Outline and Digest of Lectures given in Coöperation with the National Conservation Bureau. New York: Center

for Safety Education, Division of General Education, New York University, 1941. Price, \$1.25.

TOBACCO AND HEALTH. By Arthur H. Steinhilber and Florence M. Brunderman. 2d ed. New York: Association Press, 1941. 48 pp. Price, \$.35.

NEW HEALTH AND GROWTH SERIES. By W. W. Charters, Dean F. Smiley and Ruth M. Strang.

ALL THROUGH THE DAY. Book One. 178 pp. Price, \$.64.

THROUGH THE YEAR. Book Two. 180 pp. Price, \$.72.

HEALTH SECRETS. Book Three. 242 pp. Price, \$.76.

HEALTHFUL WAYS. Book Four. 246 pp. Price, \$.76.

LET'S BE HEALTHY. Book Five. 278 pp. Price, \$.80.

HABITS, HEALTHFUL AND SAFE. Book Six. 268 pp. Price, \$.84.

GROWING UP HEALTHILY. Book Seven. 277 pp. Price, \$.84.

A SOUND BODY. Book Eight. 310 pp. Price, \$.88.

HEALTH IN A POWER AGE. Book Nine. 333 pp. Price, \$1.08.

New York: Macmillan, 1941.

MOBILE HOMES. A STUDY OF TRAILER LIFE. By Donald Olen Cowgill. Washington: American Council on Public Affairs, 1941. 127 pp. Price, Paper, \$2.00.

SOCIOLOGY AND SOCIAL PROBLEMS IN NURSING SERVICE. By Gladys Sellev. Philadelphia: Saunders, 1941. 344 pp. Price, \$2.75.

SOCIOLOGY APPLIED TO NURSING. By Emory S. Bogardus and Alice B. Brethorst. Philadelphia: Saunders, 1941. 294 pp. Price, \$2.50.

Advertisement

Opportunities Available

PUBLIC HEALTH PHYSICIANS—(a) Physician well qualified industrial hygiene, particularly venereal diseases; municipal health department; southern metropolis. (b) Assistant director, division of maternal and child health; duties include development well-child conference program, lecturing to lay groups; \$3,600–\$4,000, travel allowance. (c) Epidemiologist; preferably physician with administrative experience, health department; \$3,800–\$4,800; East. (d) County health physician; man interested in public health as career required; Midsouth. (e) Assistant to director public health education, eastern state; writing ability important; about \$4,000. (f) Woman physician to assist in state-wide educational program in cancer control; able public speaker required; \$200, use of car, travel allowance; Midwest. (g) City physician; full-time appointment, college town of 30,000; woman physician eligible; vicinity \$4,000. (h) Venereal disease control officer; \$3,600; Southeast. PH12-1, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—(a) State university health service; some teaching experience advantageous. (b) To assist medical director, student health service; midwestern university en-

rolling 3,500 students; 9 month appointment; \$2,400. PH12-2, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—(a) Senior nurse and executive director; visiting nurse association; industrial city near Chicago. (b) Graduate nurse with degree in public health; \$2,100, travel allowance; Midwest. (c) Educational director, state health department; degree in public health, teaching background and supervisory experience required; \$2,400. (d) Assistant supervisor, municipal health department; \$150, car maintenance; South. (e) City-county nurse; salary if trained public health \$125; without specialized training, \$107; South. (f) For appointment in New England town; duties include program for schools, classes in "Child Care," cooperation in care of maternity cases; vicinity \$1,800. PH12-2, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

BACTERIOLOGISTS—(a) Bacteriologist with background in chemistry; unusual opportunity with large pharmaceutical house; East. (b) Bacteriologist; general hospital, 250 beds; Pacific Northwest. PH12-3, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

Situations Wanted

CERTIFIED PUBLIC HEALTH PHYSICIAN—Bachelor's and medical degrees from southern university; C.P.H., Johns Hopkins; 4 years, director student health service, state university; 5 years, executive position with state health department. PH12-4, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

PUBLIC HEALTH NURSE EXECUTIVE—B.S. in Nursing Education; M.S. in Health Edu-

cation; certificate in Public Health Nursing; record of successful executive experience in public health field. PH12-5, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

BACTERIOLOGIST—A.B., Ph.D., state university; 6 years, university laboratory of animal pathology; 4 years, parasitologist, state department of public health. PH12-6, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

NEWS FROM THE FIELD

CONFERENCE OF STATE SANITARY ENGINEERS

THE Conference of State Sanitary Engineers held its 22nd Annual Meeting at Atlantic City, N. J., October 12-14.

Officers for the ensuing year were elected as follows:

Chairman: H. D. Schmidt

Vice-Chairman: W. S. Johnson

Executive Committee: F. C. Roberts, A. D. Weston, B. A. Poole

Secretary-Treasurer: H. N. Old

NEW MEXICO PUBLIC HEALTH ASSOCIATION

AT its Sixteenth Annual Meeting, held in Gallup October 30 to November 1, the New Mexico Public Health Association elected the following new officers to serve for the ensuing year:

President: F. C. Diver, M.D., Raton

President-Elect: A. R. Clauser, M.D., Albuquerque

Vice-President: Harrison Eilers, M.D., Las Vegas

Secretary-Treasurer: Frances Fell, Santa Fe
Representative to A.P.H.A. Governing Council: E. F. McIntyre, M.D., Santa Fe

REORGANIZATION IN THE DEPARTMENT OF PREVENTIVE MEDICINE, TULANE UNIVERSITY, NEW ORLEANS

THE undergraduate medical teaching program in preventive medicine and public health at Tulane University is now under the direction of Dr. William Sodeman who has been appointed Professor succeeding Dr. William H. Perkins who has resigned to become Dean of Jefferson Medical College, Philadelphia. Ralph H. Heeren, M.D., formerly of the University Health Department, University of Iowa, is the Associate Professor.

NEGRO HEALTH CENTER

A NEW health center is to be built in Jacksonville, Fla., by funds raised by a group of Negroes, who have become interested in public health. The center will be operated by the Duval County Health Unit, but the lot and the building are being supplied by the Negroes.

INTERNATIONAL SOCIETY OF MEDICAL HEALTH OFFICERS

THE following officers were elected at a meeting in Atlantic City for the year 1942:

President: Dr. Angel G. Brito, Mexico City, Mexico

Vice-President: Dr. J. E. Davey, Hamilton, Ontario

Vice-President: Dr. A. J. Chesley, St. Paul, Minn.

Secretary-Treasurer: Dr. I. C. Riggin, Richmond, Va.

Directors:

Dr. F. E. Harrington, Minneapolis, Minn.

Dr. A. T. McCormack, Louisville, Ky.

Dr. Bertram P. Brown, Los Angeles, Calif.

Dr. N. A. Upchurch, Jacksonville, Fla.

Dr. R. L. Cleere, Denver, Colo.

Dr. Lawrence J. Smith, Springfield, Mass.

INTERNATIONAL ASSOCIATION OF MILK SANITARIANS

THE International Association of Milk Sanitarians held its 30th annual convention at Tulsa, Oklahoma, October 27 to 30. Officers elected for the ensuing year were:

President: Dr. Frederick W. Fabian, Michigan State College

First Vice-President: C. A. Abele, Chicago Health Department

Second Vice-President: Russel R. Palmer, Detroit Health Department

Third Vice-President: Dr. R. G. Ross, Tulsa Health Department

Secretary-Treasurer: C. Sidney Leete, New York State Department of Health

PERSONALS

Central States

CHARLES H. BENNING, M.D., M.P.H.,* former Deputy Commissioner of Health of Oakland County, Mich., for 14 years, and Director of the Royal Oak District Health Department, is now located in Puerto Rico. He was appointed Venereal Disease Consultant by the U. S. Public Health Service, with offices in the Department of Health at Santurce.

PAUL G. BUSS, M.D., formerly of Golden, Ill., has been made Superintendent of the State Health District with headquarters in Macomb.

LUDVIG HEKTOEN, M.D., Executive Director of the National Advisory Cancer Council, received a citation from the State Medical Society of Wisconsin, for distinguished service.

FRED P. HELM, M.D.,† Secretary of the Kansas State Board of Health, Topeka, has been granted a year's leave of absence to do postgraduate work at Johns Hopkins University. He is succeeded by DR. FLOYD C. BEELMAN, who has been appointed Acting Secretary.

RALPH J. JOHNSON,† formerly an engineer with the U. S. Public Health Service, has been appointed Public Health Engineer in the Peoria, Ill., Department of Health.

CHARLES N. STEPHENS, M.D., formerly of Stronghurst, has been appointed Health Officer for Industry, Ill., and vicinity.

RAGNARD T. WESTMAN, M.D., Dr.P.H.,* recently Director of Health in Kansas City, Kans., has resigned to accept a position as Surgeon in the U. S. Public Health Service.

Eastern States

WENDELL R. AMES, M.D., has resigned his position as Epidemiologist with the New York State Department of

Health, to accept a position as Commissioner of Health of Cattaraugus County.

ALLAN M. BUTLER, M.D., was commissioned Senior Surgeon in the Reserve of the U. S. Public Health Service, and called to active duty as Regional Medical Officer in the First Civilian Defense Region, with headquarters in Boston, Mass. Dr. Butler has been Assistant Professor of Pediatrics in the Harvard University Medical School.

JOHN A. DEGEN, M.D., Assistant Health Officer in the Utica, N. Y., State District Office, has resigned to accept a position as Epidemiologist with the Harvard Medical Unit in England.

PROFESSOR CURTIS M. HILLIARD,* of the Department of Biology and Public Health, Simmons College, Boston, Mass., is Director of the Health Committee of the Massachusetts State Public Safety Committee.

JOSEPH ROBY, M.D.,† Deputy Health Officer of Rochester, N. Y., since 1904, has retired.

WILLIAM E. STANLEY, C.E.,* has been given a year's leave of absence from his position as Professor of Sanitary Engineering at Cornell University to permit him to take up the duties of Chief of the Sewerage and Incineration Group in the Office of the Quartermaster General, Washington, D. C. Professor Stanley spent the past summer at Columbus, Ind., working on specifications and contract documents for the Southern Indiana Cantonment Project.

C.-E. A. WINSLOW, Dr.P.H.,* of the Department of Public Health at the Yale University School of Medicine, New Haven, Conn., has been Rosen-

* Fellow, A.P.H.A.

† Member A.P.H.A.

berg lecturer in the Public Social Services at the University of California, Berkeley, during the fall semester. Dr. Winslow recently presented two lectures before the faculty of the Medical School on "Modern Public Health Programs," and "Medical Care in Modern Society."

Southern States

GUSTAVUS DENTON BOCK, M.D., U. S. Public Health Service, Washington, D. C., has been appointed Director of the new City-County Public Health Unit established in Boise and Ada, with offices in Boise, Ida.

W. ROSS CAMERON, M.D.,* of Baltimore, Md., has been commissioned Senior Surgeon in the U. S. Public Health Service. His assignment will be to serve as Regional Medical Officer for the Third Civilian Defense Area, which includes Pennsylvania, Maryland, Virginia, and the District of Columbia.

MARION FERGUSON, R.N.,† who has been Supervisor of the Bureau of Public Health Nursing, District of Columbia Health Department, Washington, has become Educational Director in the Department of Educational Nursing in the Community Service Society of New York City.

DONALD K. FREEDMAN, M.D., formerly associated with the Social Security Board, Washington, is now P. A. Surgeon (R), U. S. Public Health Service and has been assigned as Medical Adviser to the Division of Defense Housing in the Federal Works Agency, Washington.

DALE A. GARRISON, M.D., formerly of Oklahoma City, Okla., has been appointed Health Officer of Jefferson County, Wash., succeeding Dr. LAWRENCE E. FOSTER of Port Townsend.

F. W. KITTRELL,† who for the past 11 years has been connected with the Tennessee State Health Department, is now Engineer-Secretary of the

Interstate Commission on the Potomac River Basin, Washington, D. C. W. S. LEATHERS, M.D.,* was named President-Elect, at the recent annual meeting of the Association of American Medical Colleges held in Richmond, Va. The next meeting of the Association will be held in Louisville, Ky., October 26-28, 1942, at which time Dr. Leathers will be inducted into office.

KATHERINE F. LENROOT,* Chief of the Children's Bureau, U. S. Department of Labor, Washington, has been designated Child Welfare Consultant to the Office of Defense Health and Welfare Services. DR. MARTHA M. ELIOT, the Associate Chief of the Children's Bureau has been designated Liaison Officer with the Office of Civilian Defense. CHARLES I. SCHOTTLAND has been made Liaison Officer with the Office of Defense Health and Welfare Services.

E. R. MATHEWS, is serving as Acting Director of the Division of Sanitary Engineering, South Dakota State Board of Health, succeeding W. W. TOWNE, who was granted a year's leave of absence.

ROBERT E. ROCK, M.D.,† of Opelika, Ala., has been appointed Health Officer of the Carter-Unicoi-Johnson Counties Health District, Tenn.

ALEX B. SHIPLEY, M.D.,† of Elizabethton, Tenn., Health Officer of the Carter - Unicoi - Johnson Counties Health District, has been made Director of a regional health office for East Tennessee.

W. W. TOWNE,† Director, Division of Sanitary Engineering, South Dakota State Board of Health, is now on leave of absence serving as Visiting Assistant Professor, Department of Civil Engineering, University of Missouri.

* Fellow A.P.H.A.

† Member A.P.H.A.

WILLIAM H. WALCOTT, M.D., of Milan, Tenn., is in charge of a new Health Unit in Carroll County, with headquarters in Huntingdon.

Western States

PETER D. BRINK, M.D., of Pomeroy, Wash., has been appointed Health Officer of Garfield County, Wash.

JOHN A. KAHL, M.D., Walla Walla, Wash., has been appointed Health Officer of the Walla Walla County and City Health Department.

ADOLPH WEINZIRL, M.D.,* has resigned as Health Officer of Portland, Ore., and has been appointed Director of the Social Hygiene Fund and of a new Department of Public Health established recently at the University of Oregon Medical School.

PAUL L. WEST, M.D., Seattle, Wash., has been appointed Health Officer in Chelan County.

DEATHS

J. N. BAKER, M.D.,* State Health Officer of Montgomery, Ala., died on November 9. Dr. Baker was a Member since 1930 and a Fellow since 1932.

R. CLIFFORD ERRICKSON,† Health Officer of Long Branch, N. J., for the last 25 years, died November 17. Mr. Errickson was a past president of the New Jersey State Health Officers Association and the organizer of the Monmouth County Health Unit No. 2.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

American Association for the Advancement of Science. Dallas, Tex. December 28-January 2.

American Library Association — Midwinter Conference. Chicago, Ill. December 28-31.

American Public Welfare Association—Round Table and Annual Meeting. Washington, D. C. December 12-14.

American Society of Civil Engineers—Winter Meeting. New York, N. Y. January 21-23, 1942.

American Society of Heating and Ventilating Engineers—Seventh International Heating and Ventilating Exposition. Commercial Museum, Philadelphia, Pa. January 26-30, 1942.

American Society for Public Administration. New York, N. Y. December 27-30.

American Standards Association. New York, N. Y. December 10.

American Statistical Association. New York, N. Y. December 27-31.

American Water Works Association—New York Section—Hotel Commodore, New York, N. Y. December 30.

Florida Public Health Association. Orlando, Fla. December 4-6.

Illinois Public Health Association. Springfield, Ill. December 4-5.

National Council of State Public Assistance and Welfare Directors. Washington, D. C. December 12-14.

National Public Housing Conference. January 30-31, 1942.

National Society for the Prevention of Blindness. Hotel Astor, New York, N. Y. December 4-6.

New Jersey Health and Sanitary Association, Inc.—All-day conference at the Stacy-Trent Hotel, Trenton, N. J., December 5.

Foreign

Pan American Conference of Directors of Public Health—4th. Rio de Janeiro, Brazil, 1942.



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American Journal of Public Health

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Articles, committee reports, and editorials are listed alphabetically according to the key words in the title, with many cross-references.

Editorials are indexed under "Editorials" as well as alphabetically under the key words in the title.

News notes and fillers are indexed under "News from the Field." This Section should be searched as supplemental to the title index.

Matters pertaining to the Association are indexed under "American Public Health Association" and "Year Book."

Book reviews are indexed under "Books and Reports."

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A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Paper-of-the-Month — Nine hundred delegates came to Washington to talk over the nation's nutrition problems. It is impossible to epitomize here even the fields of discussion. Every health worker worth his salt will ask for this summary of the proceedings which will later be available in completed form.

ANON. The National Nutrition Conference. *Pub. Health Rep.* 56, 24:1233 (June 13), 1941.

Putting Back the Vitamins—Although whole grain cereals are nutritionally preferred foods, the council on foods and nutrition recognizes that the preference for white flour cannot be ignored, hence it believes that it is in the interest of public health to encourage the use of enriched white flour, along with a greater use of whole wheat products.

ANON. Nutritionally Improved or Enriched Flour and Bread. *J.A.M.A.* 16, 26:2849 (June 28), 1941.

Vitamins in British Bread—In England, the new "National Flour" must contain 85 per cent of all the wheat kernel instead of the 70 per cent found in ordinary white bread. This means that the maximum amount of the germ and aleuron layer is retained with the least amount of pericarp. To this, calcium carbonate and iron salts in the prescribed amounts should be added.

ANON. National Flour for Bread. *Brit. Med. J.* 4195:828 (May 31), 1941.

State H. O.'s Discuss National Defense—What must have been a very busy national conference heard the Surgeon-General tell of the war experiences of the British medical services

and the lessons they point for us. After him, speakers proceeded to discuss our own problems of industrial hygiene, rural health services, venereal disease, and tuberculosis. Important resolutions were adopted which you should know about.

ANON. State and Territorial Health Officers Confer on Health Defences. *Pub. Health Rep.* 56, 23:1191 (June 6), 1941.

1940 Statistics Are Here—Influenza and poliomyelitis cases were more numerous in 1940 than the average for the preceding five years. Otherwise the communicable disease business for the year was below the average.

ANON. Morbidity and Mortality During 1940 and Recent Preceding Years. *Pub. Health Rep.* 56, 21:1100 (May 23), 1941.

Testing Influenza Vaccine—Half the employees of a hospital were vaccinated against influenza. A month later an epidemic occurred. Though fewer vaccinated employees became sick, the difference was not statistically significant. However, the severity and duration of the infection was markedly reduced, and that is an important finding.

DALLDORF, G., *et al.* A Controlled Clinical Test of Influenza A Vaccine. *J.A.M.A.* 116, 23:2574 (June 7), 1941.

Pneumonia Still Is Communicable—Isolation precautions should not be terminated when convalescence is apparent, but should be continued until the patient is discharged or until repeated throat cultures are negative. This is the wise conclusion reached through some sad experiences.

GELLS, S. S., and MITCHELL, A. G. Cross Infection with Type 1 Pneumococcus. *J.A.M.A.* 116, 13:2580 (June 7), 1941.

TB and Student Nurses—In one hospital, at least, the incidence of tuberculosis found among entering medical students and student nurses and the infections developing during the stay in the hospital is less than would be expected among young men and women generally in the comparable ages. Possible reasons are discussed.

HAHN, R. G., *et al.* Pulmonary Tuberculosis in Medical Students and Nurses. *Am. Rev. Tuberc.* 43, 5:600 (May), 1941.

Malnutrition North of the Border—From preliminary reports of dietary surveys in Canadian communities it appears that there, too, the nutrition of low income groups is unsatisfactory. Typically, father is the best fed, youngest children next, then older, with mother poorest fed. Calcium, the B vitamins, and iron are the great deficiencies.

McHENRY, E. W. Determination of Nutritional Status (and four related papers). *Canad. Pub. Health J.* 32, 5:231 (May), 1941.

Industrial Fact Finding and Education—A U.S.P.H.S. survey of Los Angeles recommended a municipal industrial hygiene program for the health department. At the time none of the plants surveyed had a full-time medical service. Less than half the industrial employees had physical examinations, and many potential hazards were unearthed. What the newly established division attempted should interest other municipal health officials.

NASATIR, A. V. The Los Angeles Industrial Hygiene Program. *Indust. Med.* 10, 6:236 (June), 1941.

Stitch-in-Time Department—Anticipating the loss of public health nurses, the Detroit Health Department evolved a plan of having much of the non-technical work done by lay volun-

teers. In the tuberculosis, school nursing, child welfare, and communicable disease programs there was found much that non-professionals could do.

ROSS, G. We Plan Ahead. *Pub. Health Nurs.* 33, 6:334 (June), 1941.

Tuberculous Individuals in Industry—An example of intelligent tuberculosis case finding, care, and rehabilitation in industry is reported. The findings of the study will prove of great interest to health workers generally.

SAWYER, W. A. Control of Tuberculosis. *Indust. Med.* 10, 6:221 (June), 1941.

V.D.—All the recommendations of an eminent advisory committee intended to make for more efficient state and local venereal disease control programs are too numerous and important to be summarized here. This is a State Paper for all administrators to ponder over.

VONDERLEHR, R. A., *et al.* Recommendations for a Venereal Disease Control Program. *J.A.M.A.* 116, 23:2585 (June 7), 1941.

Nervous Tissue Viruses—If in an "information, please" program you were told that there were nine forms of encephalitis due to viruses with an affinity for nervous tissue, and were asked to name at least five of them, could you do it? Then you should read this brief classification of them.

WEBSTER, L. T. Classification of Primary Encephalitides of Man According to Virus Etiology. *J.A.M.A.* 116, 26:2840 (June 28), 1941.

The Other Side of the Picture—Health workers, concerned principally with the calories and vitamins that go into the mouths of their clients, will profit by reading the discussion of the larger questions of the national supply of the protective foods.

WILSON, M. L., *et al.* Food for a Stronger America. *Survey Graphic.* 30, 7:367 (July), 1941.

ASSOCIATION NEWS

NOMINATIONS FOR THE GOVERNING COUNCIL

IN accordance with the By-Laws of the Association, the Nominating Committee for Governing Council members, consisting of one Fellow from each Section, reports the following nominations for the Governing Council. The By-Laws provide that "upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, provided such petition is received fifteen days before the Annual Meeting." The Chairman of the Committee is Huntington Williams, M.D., Commissioner of Health, Baltimore, Md. The other members are: Leverett D. Bristol, M.D., Industrial Hygiene Section; Walter H. Brown, M.D., Maternal and Child Health Section; Marjorie Delavan, Public Health Education Section; J. V. DePorte, Ph.D., Vital Statistics Section; Joseph A. Kasper, M.D., Laboratory Section; Henry M. Loomis, Food and Nutrition Section; Sol Pincus, C.E., Engineering Section; Marian G. Randall, R.N., Public Health Nursing Section; Clarence L. Scamman, M.D., Epidemiology Section; Noble A. Upchurch, M.D., Health Officers Section.

There are thirty elective councillors on the Governing Council of whom ten are elected each year. The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in Atlantic City will be elected for the three year term 1941-1944.

Gaylord W. Anderson, M.D.
University of Minnesota
Minneapolis, Minn.

Leon Banov, M.D.
Health Officer
Charleston, S. C.

Leona Baumgartner, M.D.
Department of Health
New York, N. Y.

Helen Bean, R.N.
U. S. Marine Hospital
New Orleans, La.

J. F. Blackerby
State Department of Health
Louisville, Ky.

Selwyn D. Collins, Ph. D.
U. S. Public Health Service
Bethesda, Md.

Joel I. Connolly
Department of Health
Chicago, Ill.

Hazel Corbin
Maternity Center Association
New York, N. Y.

James A. Doull, M.D.
Western Reserve University
Cleveland, Ohio

Martha M. Eliot, M.D.
Children's Bureau
Washington, D. C.

Haven Emerson, M.D.
Columbia University College of Physicians
and Surgeons
New York, N. Y.

Katharine Faville, R.N.
Henry Street Nursing Service
New York, N. Y.

J. C. Geiger, M.D.
Director of Public Health
San Francisco, Calif.

Marjorie M. Heseltine
Children's Bureau
Washington, D. C.

H. E. Kleinschmidt, M.D.
National Tuberculosis Association
New York, N. Y.

A. J. Lanza, M. D.
Metropolitan Life Insurance Company
New York, N. Y.

Kenneth F. Maxcy, M.D.
Johns Hopkins School of Hygiene and
Public Health
Baltimore, Md.

Stanley H. Osborn, M.D.
State Commissioner of Health
Hartford, Conn.

George T. Palmer, Dr.P.H.
Department of Health
New York, N. Y.

Earle B. Phelps
Columbia University College of Physicians
and Surgeons
New York, N. Y.

Alton S. Pope, M.D.
State Department of Public Health
Boston, Mass.

I. C. Riggin, M.D.
State Health Officer
Richmond, Va.

George C. Ruhland, M.D.
Health Officer
Washington, D. C.

Edith P. Sappington, M.D.
Children's Bureau
San Francisco, Calif.

Clarence D. Selby, M.D.
General Motors Corporation
Detroit, Mich.

Marion W. Sheahan, R.N.
State Department of Health
Albany, N. Y.

William P. Shepard, M.D.
Metropolitan Life Insurance Company
San Francisco, Calif.

William D. Stovall, M.D.
State Hygienic Laboratory
Madison, Wis.

Clair E. Turner, Dr.P.H.
Massachusetts Institute of Technology
Cambridge, Mass.

C.-E. A. Winslow, Dr.P.H.
Yale University School of Medicine
New Haven, Conn.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Claude M. Cooke, M.D., City Health Dept.,
City Bldg., Danville, Ill., Director of Health
Albert Dumas, M.D., D.P.H., Health Unit,
County Labelle, Mont-Laurier, Quebec,
Can., Health Officer

James V. Foley, M.D., M.P.H., Bannock
County Health Unit, Pocatello, Ida.,
Director

Owen A. Groves, M.D., Court House,
Charleston, W. Va., Kanawha County Health
Officer

Dan R. Herkimer, M.D., 1682 Fort St.,
Lincoln Park, Mich., Health Officer

Harold A. Howard, M.D., 330 Main St.,
Wethersfield, Conn., Health Officer

Andrew D. Johnston, M.D., District Health
Office, Osceola, Mo., Health Officer

Wilbert W. Lawrence, M.D., Court House,
Norwalk, Ohio, Huron County Health
Commissioner

George A. Nevitt, D.D.S., M.S.P.H., Kellogg
Foundation, Battle Creek, Mich., Fellow

Emily M. Pierson, M.D., Main St., Cromwell,
Conn., Health Officer

Harold W. Seff, M.D., Bibb County Health
Dept., Centerville, Ala., Health Officer

John F. Shrouts, M.D., M.S.P.H., 111 Dean
St., Woodstock, Ill., District Health Officer

Filbert A. Silveira, M.D., 235 Green St., Fair-
haven, Mass., Health Officer

Paul H. Stevenson, M.D., Dr.P.H., China
Medical Board, 3304 The Alameda, Balti-
more, Md., Staff Member, Peiping Union
Medical College

Laboratory Section

Elton M. Andrew, M.A., 823½-9th Ave.,
Helena, Mont., Analyst, State Board of
Health

Betty M. Bowser, M.S., 3114 Hazelhurst Ave.,
Pittsburgh, Pa., Laboratory Instructor,
Univ. of Pittsburgh

Herbert C. Brenon, Ph.D., 1574 Crossroads
of World, Hollywood, Calif., Director,
Brenette Medical Laboratory

G. John Buddingh, M.D., Vanderbilt Medical
School, Nashville, Tenn., Asst. Professor,
Dept. of Pathology

Ezra P. Casman, Ph.D., Abington Memorial

Hospital, Abington, Pa., Chief Bacteriologist
Charles A. Dille, M.D., 880 Fidelity Medical
Bldg., Dayton, Ohio, Pathologist, Good
Samaritan Hospital

W. Harry Feinstone, Sc.D., 1937 West Main
St., Stamford, Conn., Research Bacteriolo-
gist, American Cyanamid Co.

Clarence A. Fortlman, U. S. Naval Hospital,
Washington, D. C., C. Ph. M., U. S. Navy
Walvin R. Giedt, M.D., M.P.H., State Health
Laboratory, Vermillion, S. D., Asst. Direc-
tor, Div. of Laboratories, State Health Dept.

Russell W. H. Gillespie, Ph.D., 216 Forest
Ave., Vermillion, S. D., Consulting Bac-
teriologist, State Health Laboratory

Eunice Gutermute, A.B., Box 1611, Salinas,
Calif., Bacteriologist, Monterey County
Health Dept.

H. Orin Halvorson, Ph.D., 215 Millard Hall,
Univ. of Minnesota, Minneapolis, Minn.,
Professor of Bacteriology

Commander Albert P. Krueger (M.C.,
U.S.N.R.), 1770 Arch St., Berkeley, Calif.,
Officer in Charge, Laboratory Research
Unit 1

Frances M. McConnell, M.D., 1900 Dahlia
St., Denver, Colo., Director, Div. of Labo-
ratories, State Board of Health

Ruth M. Myers, M.S., 1641 Chilton St., Balti-
more, Md., Associate Bacteriologist, State
Dept. of Health

LaVerne R. Thompson, R.N., M.A., 525 West
120th St., New York, N. Y., Instructor in
Microbiology, Div. of Nursing Education,
Teachers College

Charles Urbach, M.D., Ph.D., 1730 Delancey
St., Philadelphia, Pa., Research Laboratory,
Childrens Hospital of Philadelphia

A. Elizabeth Verder, Ph.D., National Institute
of Health, Bethesda, Md., Bacteriologist,
Div. of Infectious Diseases

Onie O. Williams, M.D., St. Joseph's Hospital,
Phoenix, Ariz., Director of Laboratories

Vital Statistics Section

Herbert A. Raskin, M.S.P.H., 2491 Pingree
St., Detroit, Mich., Student, Univ. of
Michigan

Engineering Section

William L. Baugh, Jr., M.S., Box 1495,
Lubbock, Tex., Field Engineer, State Health
Dept.

Robert D. Bovey, 422 State House, Boise, Ida.,
Milk Sanitarian, State Dept. of Public
Health

J. B. Carey, B.S. in C.E., 923 Court House,
Atlanta, Ga., Sanitary Engineer, Fulton
County Dept. of Health

Arthur W. Clarkson, B.S. in C.E., Y.M.C.A.,
Hannibal, Mo., Public Health Engineer,

Hannibal-Marion County Health Dept.

C. Heard Field, 106 E. 55th St., Savannah,
Ga., Sanitary Engineer, Chatham County
Board of Health

Charles G. Hammann, Sr., B.S., 331 State
Office Bldg., Providence, R. I., Engineer in
Charge, Sanitary Inspection Section, State
Dept. of Health

Paul W. Purdom, B.S. in C.E., 1023-3rd St.,
S.E., Moultrie, Ga., Colquitt County Public
Health Engineer

Joe L. Robinson, B.S. in Ch.E., City Health
Dept., Fort Worth, Tex., Field Engineer,
Bureau of Sanitary Engineering, State
Health Dept.

R. August Schaller, B.S., State Board of
Health, Monett, Mo., District Public Health
Engineer

R. J. Schliekelman, M.S., 517 W. Maple St.,
Centerville, Iowa, Public Health Engineer,
District Health Service 2

Guy R. Scott, B.S., M.P.H., 107 Village 1,
Sheffield, Ala., Sanitary Engineer, Tennessee
Valley Authority

Walter H. Sheffield, B.S., 91-14th St., N.E.,
Atlanta, Ga., Public Health Engineer
(Trainee), State Dept. of Public Health

Marvin S. Stanley, State Board of Health,
Helena, Mont., Fiscal Agent

Taylor D. Storey, B.S. in C.E., Georgia Dept.
of Public Health, Engineering Div., Atlanta,
Ga., Assistant Engineer

Cyrus H. Watson, 528 S. 10th St., Pocatello,
Ida., Senior Sanitarian, State Dept. of
Public Health

Industrial Hygiene Section

Joe H. Latimore, B.S. in C.E., Idaho Dept. of
Public Health, Div. of I. H., Boise, Ida.,
Assistant Sanitary Engineer

William N. Wells, B.S. in Ch.E., 3403 Uni-
versity Drive, Fort Worth, Tex., Industrial
Hygiene Engineer, State Dept. of Health

Charles D. Yaffe, M.S., National Institute of
Health, Bethesda, Md., Associate Public
Health Engineer

Food and Nutrition Section

Dr. J. Almanzor Bedoya, Alfonso Ugarte 167,
P. O. Box 295, San Miguel, Lima, Peru,
S. A., Director of Technical Alimentation,
Public Health Ministry

Nicholas C. Leone, Ph.G., 5239 Shattuck Ave.,
Oakland, Calif., Food and Drug Inspector,
State Dept. of Public Health

Mario Quinones, M.D., 2a Sinaloa 55, Mexico,
D. F., Mexico, Secretary General, Dept. of
Health

Dorothy Spurling, B.S., Ukiah, Calif.,
Nutritionist, State Dept. of Public Health

Maternal and Child Health Section

- Agnes L. Fuller, 425 W. 21st St., New York, N. Y., Supervising Nurse, City Dept. of Health
- Warren H. Gardner, Ph.D., 718 Oregon Bldg., Portland, Ore., Consultant in Hearing and Vision, State Board of Health
- Majorie A. Hicok, B.S., 1125 Jay St., Colusa, Calif., Dental Hygienist, Bureau of Maternal and Child Hygiene, State Dept. of Health
- Hilda H. Kroeger, M.D., Court House, Room 14, Tucson, Ariz., Assistant Director, Health Dept.
- Marie-Louise Pareti, M.D., 906 Main St., Franklin, La., Associate Director, St. Mary Parish Health Center
- Dr. Earl J. Sauer, 110 N. Morrison Ave., Collinsville, Ill., Assistant Dentist, Div. of Dental Health Education, State Dept. of Health
- Inez C. Tyler, M.D., C.P.H., Kern County Health Dept., Bakersfield, Calif., Director of Maternal and Child Hygiene

Public Health Education Section

- Harry L. Acker, B.S., 2425 Blossom St., Columbia, S. C., Field Agent, Div. of Venereal Disease Control, State Board of Health
- Tomas Blanco, M.D., 24 Magdalena Ave., Santurce, Puerto Rico, Director of Health Education, Insular Dept. of Health
- Joseph D. DeMasi, M.Ed., 1044 Chapel St., New Haven, Conn., State Health Supervisor, National Youth Administration
- Mildred I. Derenbaker, R.N., 4170 Bancroft St., San Diego, Calif., Senior Stenographer-Clerk, San Diego County Health Dept.
- Emily M. Duntz, M.S., 12 Seneca St., Geneva, N. Y., Executive Secretary, Ontario County Committee on Tuberculosis and Public Health, Inc.
- Dalton O'Brien, M.D., 94 Larchwood Drive, Cambridge, Mass., Medical Supervisor, Posture Dept., Cambridge School Dept.
- Rigoberto Rios-Castro, Independencia No. 2, Santiago, Chile, S. A., Chief, Div. of Health Education, National Public Health Service
- Warren H. Southworth, M.A., 260 Waverley Ave., Watertown, Mass., Teacher, Dept. of Biology and Public Health, Massachusetts Institute of Technology
- Arthur W. Towne, B.A., Loew Bldg., Syracuse, N. Y., Secretary, Onondaga Health Assn.
- Richard T. Viguers, LL.B., 41 E. 57th St., New York, N. Y., Associate, Div. of Rural Hospitals, The Commonwealth Fund

Public Health Nursing Section

- Eva L. Borden, State Dept. of Public Health, Santa Fe, N. M., Midwife Consultant
- Irene E. Carlson, R.N., 45 Second St., Room 409, San Francisco, Calif., Field Supervisor, California Tuberculosis Assn.
- Edith Carr, R.N., B.S., 1600 N. 8th St., Boise, Ida., Acting Director, Public Health Nursing, Dept. of Health
- Bertha W. Griffith, Harney County Health Assn., Burns, Ore., Public Health Nurse
- Lois Heagler, R.N., 1803 Pine St., St. Louis, Mo., District Supervisor, Municipal Visiting Nurses
- Thelma M. Jones, Bannock County Health Unit, Pocatello, Ida., Senior Public Health Nurse
- Opal Jordon, R.N., Bannock County Health Unit, Pocatello, Ida., Public Health Nurse
- Charlotte McLoughlin, R.N., Kanawha County Health Dept., Charleston, W. Va., Public Health Nurse
- Edith M. Mills, Portola, Plumas County, Calif., District Nurse, Bureau of Child Hygiene, Plumas County School System
- Virginia E. Platt, R.N., M.A., 2340 Clay St., San Francisco, Calif., Instructor and Supervisor in Public Health, Stanford Univ.

Epidemiology Section

- Solomon J. Axelrod, M.D., Erlanger Hospital, Chattanooga, Tenn., Junior Medical Officer, State Dept. of Health
- Herman Goodman, M.D., 18 East 89th St., New York, N. Y., Assistant Director, Bureau of Social Hygiene, Dept. of Health

Unaffiliated

- Abraham H. Bayer, B.S., 710 Eastern Ave., Schenectady, N. Y., Director of Research and Production, General Ice Cream Corp.
- R. C. Bellingham, D.D.S., Cascade, Mont., School Dentist, County-City Health Dept.
- Charles H. Carpenter, D.D.S., State Health Dept., Cheyenne, Wyo., Director, Div. of Dental Health
- Merrill F. Krughoff, M.A., 910 Fidelity Bldg., Dallas, Tex., Executive Secretary, Council of Social Agencies
- Mildred Mumby, M.D., 1872 Hamlin St., Seattle, Wash.

DECEASED MEMBERS

- B. BARRETT GILMAN, M.D., Boston, Mass., Elected Member 1937
- ALLEN KRAMER KRAUSE, M.D., Providence, R. I., Elected Member 1925
- JOHN J. SHAW, M.D., Harrisburg, Pa., Elected Member 1939

A.P.H.A. MERIT SYSTEM STUDY

MILTON ROSE, M.D., Professor of Public Health, School of Medicine, University of Pennsylvania, has joined the Association staff for the summer months as Consultant to the Merit System Study. This project was undertaken as the result of a request from federal and state agencies to the Committee on Professional Education for assistance to the states in setting up merit systems for public health personnel. A Subcommittee on Merit Systems was appointed by the Committee on Professional Education consisting of George H. Ramsey, M.D., Chairman, Reginald M. Atwater, M.D., Martha L. Clifford, M.D., Dorothy Deming, R.N., Alfred H. Fletcher, and W. Frank Walker, Dr.P.H. The work is under the supervision of a Joint Conference Committee between the Conference of State and Territorial Health Officers and the Merit Systems Subcommittee, with Felix J. Underwood, M.D., acting as Chairman of the Conference Committee and Edward S. Godfrey, Jr., M.D., and Robert H. Riley, M.D., the other representatives from the Conference of State and Territorial Health Officers.

"CREDIT LINES" WILL BE CONTINUED

AT its June meeting, the Editorial Board reviewed the eleven months'

experience with "Credit Lines" as a feature of the *Journal* and voted to invite Dr. Donald B. Armstrong and John Lentz to continue this feature with the expectation that the content would be built even closer to some of the pertinent section interests.

Many of the readers of the *Journal* who have expressed an interest in this feature will be glad to know that "Credit Lines" will resume with the September issue of the *Journal*.

ML. VS. CC.

THE Editorial Board of the AMERICAN JOURNAL OF PUBLIC HEALTH at its June meeting considered a uniform designation for .001 liter. It was noted that among chemical and physical journals and other publications the trend was unmistakably in the direction of using milliliter (ml.) instead of cubic centimeter (cc.).

In addition to the clear trend in the direction of the use of ml., the Coördinating Committee of the Laboratory Section and the Committee on Research and Standards have approved the use of ml. in the manuscript for the forthcoming Eighth Edition of *Standard Methods for the Examination of Dairy Products*, and the Editorial Board voted to standardize all A.P.H.A. publications on the term ml., since it was the proper metric liquid measure.

SEVENTIETH ANNUAL MEETING
ATLANTIC CITY, N. J., OCTOBER 14-17, 1941

HEADQUARTERS
Convention Hall

RAILROAD FARES FROM VARIOUS POINTS TO ATLANTIC CITY, N. J.

*American Public Health Association
October 14-17, 1941*

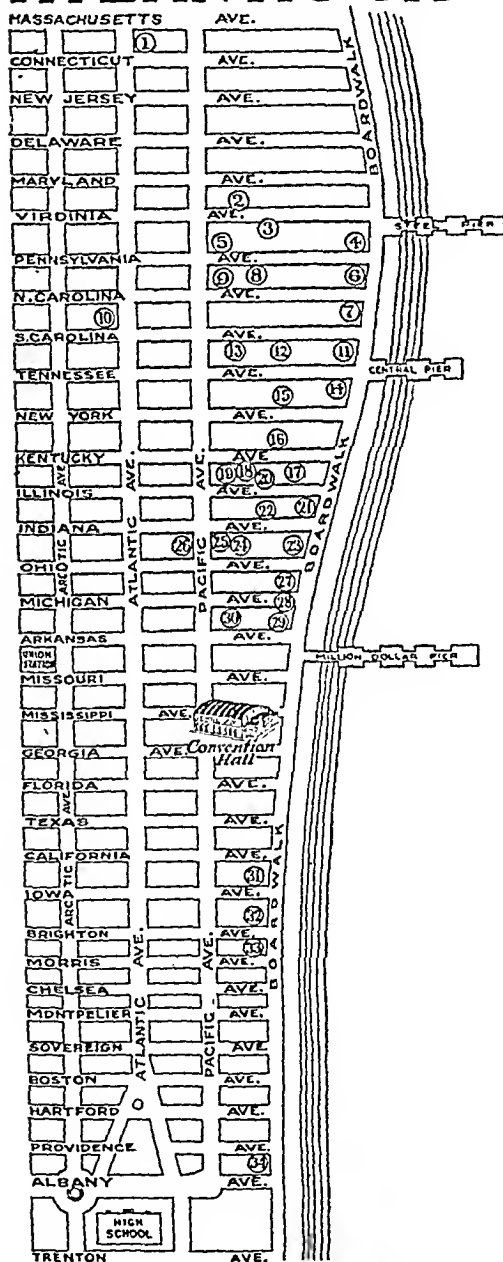
From	One-way for Pullman Travel	Round-trip for Pullman Travel	One-way Lower Berth	One-way Upper Berth
Atlanta, Ga.	\$24.95	\$39.70(2)	\$6.60(8)	\$5.15(8)
Baltimore, Md.	4.90	9.65(3)	2.65	1.80
Boston, Mass.	11.90	22.60(1)	3.20(8)	2.35(8)
Buffalo, N. Y.	14.30	27.20(3)	3.15	2.20
Chicago, Ill.	26.30	47.70(3)	6.30	4.35
Cleveland, O.	16.15	30.50(3)	3.95	2.70
Dallas, Tex.	46.79	72.40(3)	12.40(8)	9.55(8)
Denver, Col.	57.36	94.30(3)	13.95(8)	10.75(8)
Duluth, Minn.	39.97	68.25(3)	9.50(8)	7.35(8)
Fort Worth, Tex.	47.68	73.70(3)	12.40(8)	9.55(8)
Indianapolis, Ind.	23.35	42.85(3)	6.05	4.15
Jacksonville, Fla.	29.50	46.50(2)	7.90(8)	6.15(8)
Kansas City, Mo.	39.10	67.90(3)	9.45	7.20
Louisville, Ky.	25.15	45.80(3)	6.30	4.35
Los Angeles, Cal.	90.54	138.00(6)	22.60(8)	17.35(8)
Memphis, Tenn.	33.90	53.10(2)	8.95	6.80
Milwaukee, Wis.	28.85	51.55(3)	6.85(10)	4.90(10)
Minneapolis, Minn.	38.51	66.05(3)	8.95(8)	6.95(8)
Nashville, Tenn.	27.65	43.75(2)	7.10	5.40
New Orleans, La.	39.50	61.50(2)	10.00(8)	7.75(8)
New York, N. Y.	4.10	7.00(1)	.80(7)	
Omaha, Nebr.	41.21	70.15(3)	9.50(8)	7.35(8)
Philadelphia, Pa.	2.05	2.30(4) 2.55(5)	.55(7)	
Pittsburgh, Pa.	12.50	23.95(3)	3.15	2.20
Portland, Ore.	90.69	138.00(6)	22.60(8)	17.35(8)
Salt Lake City, Utah	71.09	107.05(6)	17.10(8)	13.15(8)
San Francisco, Cal.	90.54	138.00(6)	22.60(8)	17.35(8)
Seattle, Wash.	90.69	138.00(6)	22.60(8)	17.35(8)
St. Louis, Mo.	30.75	55.35(3)	7.65	5.25
Washington, D. C.	6.05	11.85(3)	2.65	1.80
Montreal, Que.	16.05	32.15(3)	3.70(8)	2.75(8)
Halifax, N. S.	34.70	63.80(1)	8.45(8)	6.35(8)
Ottawa, Ont.	18.35	36.85(3)	4.30(9)	3.35(9)
Quebec, P. Q.	20.65	40.55(3)	5.30(8)	3.80(8)
Toronto, Ont.	18.50	34.80(3)	3.70(8)	2.75(8)
Vancouver, B. C.	90.69	138.00(6)	22.60(8)	17.35(8)

NOTES: (1) 10 day limit (2) 30 day limit (3) 60 day limit (4) 2 day limit
 (5) 4 day limit (6) 3 months limit (7) seat (8) berth to Philadelphia
 (9) seat to Montreal, berth to Philadelphia, seat to Atlantic City
 (10) seat to Chicago, berth to Atlantic City

RATES QUOTED BY ATLANTIC CITY HOTELS
Seventieth Annual Meeting, October 14 to 17, 1941
 AMERICAN PUBLIC HEALTH ASSOCIATION

ALL RATES QUOTED ARE FOR ROOMS WITH BATH ON EUROPEAN PLAN
 (Rooms without Bath and Two Bedrooms with Bath Between Are Available in Some Hotels)

ATLANTIC CITY



Boardwalk Hotels

Key No.	Single Rooms with Bath	Double Rooms with Bath
32 Ambassador ...	\$3-\$4-\$5-\$6	\$6-\$7-\$8-\$10
22 Brighton	\$3-\$4-\$5	\$5-\$6-\$7-\$8
6-7 Chalfonte-Haddon Hall	\$3-\$4-\$5-\$6-\$8	\$6-\$8-\$10-\$12
33 Chelsea	\$3-\$4-\$5	\$5-\$6-\$7-\$8
28 Dennis	\$3.50-\$4-\$5-\$6	\$6-\$7-\$8-\$9-\$10
14 Knickerbocker	\$3-\$3.50-\$4	\$5-\$6-\$7
11 New Belmont	\$2.50-\$3	\$4-\$5-\$6-\$7
34 President ...	\$3	\$5.50-\$7-\$8
31 Ritz - Carlton	\$3-\$3.50-\$4-\$5	\$5-\$6-\$7-\$8-\$10
4 Seaside	\$3-\$3.50-\$4	\$5-\$6-\$7
29 Shelburne ...	\$4-\$5-\$6-\$8-\$10	\$6-\$7-\$8-\$10-\$12
21 Traymore ...		\$8-\$10-\$12

All hotels offer Suites and DeLuxe Rooms. Rates can be ascertained by direct correspondence with the individual hotels.

Avenue Hotels

Key No.	Single Rooms with Bath	Double Rooms with Bath
30 Arlington ...	\$3.50-\$4	\$5-\$6
19 Byron		\$4.50-\$5-\$5.50-\$6
8 Colton Manor	\$3-\$3.50-\$4-\$5	\$5-\$6-\$7-\$8-\$9
25 Crillon*		\$5-\$6
26 Eastbourne ..		\$4.50-\$5-\$6
15 Flanders	\$3-\$4	\$5
24 Glaslyn-Chatham		\$5
17 Jefferson	\$3-\$3.50	\$5-\$6
18 Kentucky ...	\$2.50	\$4
9 Lafayette ...	\$3-\$3.50-\$4	\$5-\$6-\$7
20 Madison	\$3-\$3.50-\$4	\$5-\$6-\$7
16 Monticello ..		\$5
3 Morton	\$2.50-\$3-\$3.50-\$4	\$5-\$6-\$7
10 Penn -Atlantic	\$3	\$5
13 Princess	\$2.50	\$4
Runnymede ..	\$2.50-\$3-\$3.50-\$4	\$4-\$5-\$6-\$7
12 Senator	\$3-\$3.50-\$4	\$5-\$6-\$7

* Breakfast Included

MORE than 1,000 reservations have already been made in the headquarters hotel—The Traymore—and other nearby hotels. Only double rooms at \$8.00 and up remain in the Traymore. The lower priced accommodations in all hotels naturally go first. Reservations should be made promptly on the form printed below. Please send it to the Hotel Committee, 16 Central Pier, Atlantic City, N. J., and *not* to the Association office.

Between Convention Hall and the Traymore, the Boardwalk hotels where rooms are still available are the Shelburne and the Dennis. Beyond the Traymore, the Knickerbocker, Belmont, Chalfonte-Haddon Hall, and Seaside all offer excellent accommodations. Beyond Convention Hall, there are the Ritz-Carlton, Ambassador, and Chelsea Hotels. Do not overlook the Avenue hotels. Some are removed only a little distance from the Boardwalk, which to many people is no disadvantage.

.....(Cut off on this line and mail to Mr. Morgan).....

APPLICATION FOR HOTEL ACCOMMODATIONS

American Public Health Association

In making application for hotel accommodations, it is necessary that at least three choices of hotels be indicated and that a reasonable range of rates desired be shown. Whenever possible, arrangements should be made for double occupancy of rooms; only a limited number of single rooms are available.

A. J. MORGAN, Chairman
HOTEL COMMITTEE19.....
16 Central Pier,
Atlantic City, N. J.

Dear Sir;—Please make hotel reservations noted below:

Hotel First Choice
Hotel Second Choice
Hotel Third Choice

.... Double Rooms with bath for persons.Rate desired \$.... to \$.... per day
.... Single Rooms with bath.Rate desired \$.... to \$.... per day
.... Suites—Parlor, Bedroom(s) with bath for persons.Rate desired \$.... to \$.... per day
Arriving October, hour A.M. P.M. Leaving

If the hotel of first choice is unable to accept the reservation, the HOTEL COMMITTEE will endeavor to comply with your second or third choice in the order named. You will receive direct confirmation from the hotel accepting the reservation when made.

Rooms will be occupied by:

Name	Street Address	City	State

Preliminary Program of the Scientific Sessions of the 70th Annual Meeting of the American Public Health Association, and Meetings of Related Organizations, and of the Eighth Institute on Public Health Education

Atlantic City, N. J.

October 11-17, 1941

THE Annual Meeting Program Committee offers a preview of the content of scientific sessions planned in connection with the 70th Annual Meeting in Atlantic City, N. J. Inaccuracies and omissions are to be expected and it is hoped they will be excused. The professional affiliations and addresses of speakers are not given, but a complete index to participants will be published in the final program which will be distributed to all delegates at the Registration Desk, Convention Hall. Registration headquarters will be opened at 9:30 A.M. on Sunday, October 12.

THE EIGHTH INSTITUTE ON PUBLIC HEALTH EDUCATION

(Under the Auspices of the Public Health Education Section of the American Public Health Association)

SATURDAY, SUNDAY, MONDAY, AND TUESDAY A.M.

Saturday

6:30 P.M. *Dinner Meeting for Leaders and Committee—Stratosphere Room, Hotel Traymore.*

Preview of the Institute Program. IRA V. HISCOCK, Sc.D.

Leadership in Health Education. H. A. OVERSTREET, Ph.D.

Sunday

9:30 A.M. *First General Session—Room E, Convention Hall.*

Outline of Institute Program. IRA V. HISCOCK, Sc.D., *Chairman*

Basic Principles for Health Education. HARRY S. MUSTARD, M.D.

10:30 A.M. *Group Discussions with Leaders—Convention Hall.*

1. Health Instruction by the Nurse. MARGARET G. ARNSTEIN, R.N.

2. Health Instruction in Child Health Conferences. MAYHEW DERRYBERRY, Ph.D., and JULIUS LEVY, M.D.

3. Health Instruction by the Sanitarian. MARTIN A. POND, M.P.H.

INSTITUTE ON PUBLIC HEALTH EDUCATION (Cont.)

Sunday, 10:30 A.M. (Cont.)

4. How to Make Exhibits. HOMER N. CALVER.
5. A Coöperative Health Education Project on Tuberculosis in a High School.* SOPHIE RABINOFF, M.D.
 - a. The Plan in Action—Rôle of Teacher. H. S. DUGLATZ, PH.D.
 - b. Student Participation. CLEMENT LAVIN.
 - c. Adaptation of Experience to Coöperative Health Work. KATHERINE Z. W. WHIPPLE.
6. Planning the School Curriculum for Health Education, Teacher Participation, and Faculty Health Councils. VIVIAN DRENCKHAHN.

2:00 P.M. *Group Discussions with Leaders—Hotel Traymore.*

1. How to Lead Discussion. JULIUS E. WARREN.
(Demonstration will include participation of lay and professional committee members.)
2. Exhibit Mistake Clinic. BRUNO GEBHARD, M.D.
 - a. What to Say. H. E. KLEINSCHMIDT, M.D.
 - b. How to Show. BRUNO GEBHARD, M.D.
 - c. How to Build. ROBERT SCHMUCK.
 - d. How to Use. DAVID B. TREAT.
3. A Health Department's Appraisal of Its Educational Materials and Methods. MARGARET WITTER BARNARD, M.D.
 - A. District Health Officer Committee Reports:
 - a. Evaluation of Pamphlets. EUGENE O. CHIMENE, M.D.
 - b. Exhibits and Visual Aids. JOHN B. WEST, M.D.
 - c. Health Education in Coöperation with Schools. HAROLD H. MITCHELL, M.D.
 - d. Meetings and Community Organization. MAX BERNSTEIN, M.D.
 - e. Monographs on Essential District Work. JEROME MEYERS, M.D.
 - B. The Health Officer as an Educational Leader in His Community. DOROTHY B. NYSWANDER, PH.D.
 - C. Fitting the Broad Educational Program to Local Needs. CHARLES F. BOLDUAN, M.D.
4. Educational Technics for Nutrition. ESTELLA FORD WARNER, M.D.

4:00 P.M. *Motion Picture Demonstration—Grand Ball Room, Hotel Traymore.* ALICE V. KELIHER, PH.D.5:00 P.M. *Relaxation Hour—Rose Room, Hotel Traymore.*

* Joint Participation of East Harlem Health Center, Department of Health, Benjamin Franklin High School, and New York Tuberculosis and Health Association, New York, N. Y.

INSTITUTE ON PUBLIC HEALTH EDUCATION (Cont.)

Monday

9:30 A.M. *Second General Session—Room E, Convention Hall.*

Psychological Approaches to Health Instruction. MAYHEW DERRY-BERRY, PH.D.

10:30 A.M. *Group Discussions with Leaders—Convention Hall.*

1. Principles of Unit Construction. MARY ELIA CHAYER.

Participants:

ARTHUR J. JONES, PH.D.

BESS EXTON

FANNIE B. SHAW

RUTH E. GROUT, PH.D.

2. Participation of Professional Groups in Health Education. W. W. BAUER, M.D.

3. Steps in the Preparation of a Health Department Report. GEORGE H. RAMSEY, M.D.

4. Interrelation of Health Education and Group Work Programs. EDITH GATES.

5. The Contribution of Citizens' Committees to Health Education. EVELYN K. DAVIS

2:00 P.M. *Group Discussions with Leaders—Convention Hall.*

1. Do We Speak the Same Language? Some Definitions of Terms Used in Health Education. DELBERT OBERTEUFFER, PH.D.

Participants:

RUTH E. GROUT, PH.D.

FANNIE B. SHAW

GEORGE H. RAMSEY, M.D.

LEONA BAUMGARTNER, M.D.

2. Panel Discussion—Health Education Procedures for Local Dental Health Programs. J. M. WISAN, D.D.S.

3. Current and Future Programs of Education Regarding Syphilis and Gonorrhea. R. A. VONDERLEHR, M.D.

4. Printed Matter Clinic. JOHN HALL and RAYMOND S. PATTERSON, PH.D.

5. Coöperation of Specialty Groups in Health Education. MARY P. CONNOLLY.

6. Educational Publicity Consulting Service and Demonstration of Source Material. MARY SWAIN ROUTZAHN.

4:30 P.M. *Conducted Tour of Exhibits.* BRUNO GEBHARD, M.D., and HOMER N. CALVER.

INSTITUTE ON PUBLIC HEALTH EDUCATION (Cont.)

Tuesday

9:30 A.M. Third General Session—Room E, Convention Hall.

Highlights of the Institute. H. E. KLEINSCHMIDT, M.D., DOROTHY B. NYSWANDER, PH.D., WILLIAM P. SHEPARD, M.D., EARLE G. BROWN, M.D., and IRA V. HISCOCK, Sc.D.

Throughout the Institute, Educational Publicity Consulting Service and Demonstrations of Source Material will be conducted by Mrs. Mary Swain Routzahn at Consultation Headquarters in Convention Hall. Source Materials—National Health Agencies.

NOTE: A final program of the Institute may be obtained from the Association office, 1790 Broadway, New York, N. Y. The registration fee is \$3.00 for members of the American Public Health Association; and \$6.00 for all others. Registration will be closed at the discretion of the Chairman and early enrollment is accordingly recommended.

OTHER SATURDAY, SUNDAY, AND MONDAY MEETINGS

AMERICAN SCHOOL HEALTH ASSOCIATION

Monday, 2:30 P.M. First General Session—Room E, Convention Hall.

Presiding: AMOS L. BEACHLER, M.D., President.

SYMPOSIUM ON CURRENT PROBLEMS IN SCHOOL HEALTH
ADMINISTRATION

School Health Administration—An Overview. HAROLD D. CHOPE, M.D.

School Sanitary Problems as Observed by the Public Health Engineer. JOEL I. CONNOLLY.

Teachers Are Human, Too. FREDRIKA MOORE, M.D.

Relationship of Reading Ability to Visual Efficiency as Determined by Snellen and Telebinocular Tests. CHARLES E. SHEPARD, M.D.

Community Planning in School Health Education. ALICE H. MILLER, C.P.H.

Discussion: CHARLES C. WILSON, M.D., and LeROY A. WILKES, M.D.

Monday, 6:30 P.M. Dinner Session—Como Hall, Hotel Chelsea.

Presiding: CHARLES H. KEENE, M.D.

Address of Welcome. NORMAN J. QUINN, M.D.

THE ASTORIA-LONG ISLAND CITY SCHOOL HEALTH STUDY

Educational Aspects. DOROTHY B. NYSWANDER, PH.D.

Health Service Aspects. GEORGE M. WHEATLEY, M.D.

Discussion: GEORGE T. PALMER, DR.P.H., and HAROLD H. MITCHELL, M.D.

AMERICAN SOCIAL HYGIENE ASSOCIATION

Sunday, 8:30 P.M. *Grand Ball Room, Hotel Traymore.*

PROTECTING DEFENSE INDUSTRIAL WORKERS FROM
VENEREAL DISEASES

Presiding: LEVERETT D. BRISTOL, M.D.

Protection of Workers in Civilian Defense Industries. JAMES G. TOWNSEND, M.D.

Protection of Workers in Government Defense Industries (Arsenals, Navy Yards, Etc.). CAPTAIN ERNEST W. BROWN.

Point of View of the Employer. Speaker to be announced.

Point of View of Organized Labor. Speaker to be announced.

Discussion Leader: WALTER CLARKE, M.D.

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

Monday, 6:30 P.M. *Dinner Session—Submarine Grill, Hotel Traymore.*

COMMITTEE ON ADMINISTRATIVE PRACTICE

Monday, 2:00 P.M. *Room F, Convention Hall.*

Presiding: E. L. BISHOP, M.D.

This is an open session to which the general membership of the Association is invited.

The program will begin with a brief review by E. L. Bishop, M.D., of the work of the Committee on Administrative Practice during the past year. There will follow discussions on the Allocation of Funds to County and City Health Departments, and the Evaluation of Public Health Practices through the new fact-finding schedule for the Health Conservation Contests.

The respective sponsors are the Study Committee to Develop Principles and Criteria for the Allocation of Public Health Funds from the State to Municipal and Rural Health Units, Harry S. Mustard, M.D., *Chairman*, and the Subcommittee on Health Conservation Contests, Henry F. Vaughan, Dr.P.H., *Chairman*.

CONFERENCE OF MUNICIPAL PUBLIC HEALTH
ENGINEERS

Monday, 9:30 A.M. *Committee Room 2, Convention Hall.*

Housing and the Public Health Engineer. C.-E. A. WINSLOW, Dr.P.H.
Discussion.

Public Health Engineers in Defense. A. GRANT FLEMING, M.D.

Monday, 2:30 P.M. *Committee Room 2, Convention Hall.*

Committee Reports.

Business Session.

Election of Officers.

CONFERENCE OF MUNICIPAL PUBLIC HEALTH
ENGINEERS AND CONFERENCE OF STATE
SANITARY ENGINEERS

Monday, 12:30 P.M. *Pine Room, Hotel Traymore—Joint Luncheon.*

For the officers and executive committee of the Conference of Municipal Public Health Engineers and officers and representatives of the Conference of State Sanitary Engineers.

Brief discussion on ways and means of coordinating the committee work of the two Conferences.

CONFERENCE OF STATE AND PROVINCIAL PUBLIC
HEALTH LABORATORY DIRECTORS

Monday, 9:30 A.M. and 2:30 P.M. *Room G, Convention Hall.*

Monday, 12:30 P.M. *Luncheon Session—Submarine Grill, Hotel Traymore.*

CONFERENCE OF STATE DIRECTORS OF HEALTH
EDUCATION

Monday, 9:30 A.M. and 2:30 P.M. *Committee Room 4, Convention Hall.*

CONFERENCE OF STATE DIRECTORS OF PUBLIC HEALTH
NURSING

Monday, 9:30 A.M. and 2:30 P.M. *Committee Room 11, Convention Hall.*

CONFERENCE OF STATE SANITARY ENGINEERS

Sunday, 10:00 A.M., 2:00 P.M. and 8:00 P.M. *Mandarin Room, Hotel Traymore.*

Monday, 9:00 A.M. and 2:00 P.M. *Committee Room 3, Convention Hall.*

Monday, 8:00 P.M. *Mandarin Room, Hotel Traymore.*

CONFERENCE ON ORTHOPEDIC NURSING

Saturday, 9:30 A.M. and 2:30 P.M. *Chippendale Room, Hotel Traymore.*

Sunday, 9:30 A.M. and 2:30 P.M. *Chippendale Room, Hotel Traymore.*

Limited to 30 supervisors—registration closes September 15. Applications should be addressed to Jessie L. Stevenson, R.N., National Organization for Public Health Nursing, 1790 Broadway, New York, N. Y.

INTERNATIONAL SOCIETY OF MEDICAL HEALTH
OFFICERS

Monday, 9:30 A.M. and 2:30 P.M. *Room D, Convention Hall.*

Monday, 6:30 P.M. *Dinner Session—Belvedere Room, Hotel Traymore.*

NEW JERSEY HEALTH AND SANITARY ASSOCIATION

Monday, 6:30 P.M. *Dinner Session—Wedgewood Room, Hotel Chelsea.*

For Whom the Bell Tolls. ABEL WOLMAN, DR.ENG.

SESSIONS FROM TUESDAY, OCTOBER 14, TO FRIDAY,
OCTOBER 17, INCLUSIVE

TUESDAY, 9:30 A.M.

HEALTH OFFICERS

First Session—Room F, Convention Hall

Presiding: EARLE G. BROWN, M.D.

SYMPOSIUM ON MENTAL HYGIENE

The Hospital Treatment of Mental Patients in the United States.
SAMUEL W. HAMILTON, M.D.

Administrative Organization for Mental Hygiene in the United States.
V. H. VOGEL, M.D.

The Relationship of Mental Hygiene to a Local Health Department
Program. WILLIAM F. ROTH, JR., M.D., W. C. WILLIAMS, M.D., and
F. H. LUTON, M.D.

The Connecticut State Health Department Mental Hygiene Program.
JAMES M. CUNNINGHAM, M.D.

The Public Health Significance of Mental Hygiene Problems Appear-
ing in Criminal and Traffic Courts. LOWELL S. SELLING, M.D.

EPIDEMIOLOGY

First Session—Room A, Convention Hall

Presiding: JOHN A. FERRELL, M.D.

Address of the Chairman. JOHN A. FERRELL, M.D.

Prophylactic Value of Pertussis Vaccine as Determined by a 3 Year
Field Study. JAMES E. PERKINS, M.D.

Opsonocytaphagic Response to Whooping Cough Vaccination. ALVIN E.
KELLER, M.D., J. CYRIL PETERSON, M.D., and PAUL M. DENSEN, D.Sc.

Development of Tuberculosis and Changes in Sensitivity to Tuberculin
During Ten Years in an Institution for the Feeble-minded. DAVID
ZACKS, M.D., and PHILIP E. SARTWELL, M.D.

The Epidemiology of Tuberculosis in a Mental Hospital. JOHN K.
DEEGAN, M.D., J. E. CULP, M.D., and F. BECK, M.D.

Tuberculosis Among Ten Thousand Mentally Ill Patients, as Revealed
by 35 Millimeter Chest Films and Gastric Lavage. HERMAN E.
HILLEBOE, M.D., RANDALL B. HAAS, M.D., and CARROLL E. PALMER, M.D.

TUESDAY, 9:30 A.M.

LABORATORY

First Session—Room D, Convention Hall

Presiding: ELLIOTT S. ROBINSON, M.D.

Section Business.

Report of the Coördinating Committee on Standard Methods. *Chairman,* LIEUTENANT COLONEL A. PARKER HITCHENS, M.D.

Report of the Standard Methods Committee on Biology of the Laboratory Animal. *Chairman,* COLONEL RAYMOND A. KELSER, PH.D.

Report of the Standard Methods Committee on Biological Products. *Chairman,* ELLIOTT S. ROBINSON, M.D.

Report of the Laboratory Section Representative on the Commission for the Study of Biological Stains. WILLIAM D. STOVALL, M.D.

The Isolation of Group I Meningococci from the Genitourinary Tract of Nine Patients. CHARLES M. CARPENTER, M.D., and RUTH CHARLES.

Laboratory Methods in Tuberculosis. HENRY C. SWEANY, M.D.

Therapeutic Use of Normal Human Plasma and Serum. SIDNEY O. LEVINSON, M.D.

Discussion: LIEUTENANT COMMANDER L. R. NEWHOUSER, M.D.

Methods of Production and Control of Normal Human Plasma and Serum. MILTON V. VELDEE, M.D.

Discussion: JOHN REICHEL, V.M.D.

ENGINEERING SECTION, CONFERENCE OF STATE
SANITARY ENGINEERS, AND CONFERENCE OF
MUNICIPAL PUBLIC HEALTH ENGINEERS

Joint Session—Room G, Convention Hall

Presiding: HARRY B. HOMMON, B. A. POOLE and AIMÉ COUSINEAU.

Report of the Committee on Water Supply. *Chairman,* ANSELMO F. DAPPERT.

Report of the Committee on Industrial Sanitation. *Chairman,* W. SCOTT JOHNSON.

Report of the Committee on Waterways Pollution. *Chairman,* CARL E. GREEN, C.E.

Report of the Committee on Sewage Disposal. *Chairman,* LANGDON PEARSE.

Report of the Committee on Plumbing. *Chairman,* JOEL I. CONNOLLY.

TUESDAY, 9:30 A.M.

INDUSTRIAL HYGIENE

*First Session—Room C, Convention Hall**Presiding:* WILLIAM J. McCONNELL, M.D.

Address of the Chairman. Mobilization of Industrial Hygiene for National Defense. WILLIAM J. McCONNELL, M.D.

Industrial Hygiene in Canada's Defense Program. KINGSLEY KAY, PH.D.

Management's Interest in the Maintenance of Employee Health. B. H. SWEENEY.

The State Medical Society's Responsibility in Industrial Hygiene. RAYMOND HUSSEY, M.D.

FOOD AND NUTRITION

*First Session—Room H, Convention Hall**Presiding:* A. C. HUNTER, PH.D.

MILK AND DAIRY PRODUCTS

Is There a Need for the Reinforcing of Milk? E. V. McCOLLUM, PH.D.

Thiamine Content of Milk in Relation to Vitamin B₁ Requirements of Infants. ELIZABETH KNOTT, PH.D.

Availability of Calcium in Milk. JULIA P. OUTHOUSE, PH.D.

Growth Promoting Quality of Milk Protein. CARRELL H. WHITNALL, PH.D.

Report of the Committee on Milk and Dairy Products. *Chairman,* MERRILL J. MACK.

TUESDAY, 12:30 P.M.

MATERNAL AND CHILD HEALTH

*Luncheon Session—Rose Room, Hotel Traymore**Section Business.*

TUESDAY, 12:30 P.M.

LABORATORY

Luncheon Session—Belvedere Room, Hotel Traymore

LOOKING INTO THE PAST AND FUTURE OF THE SECTION

Report of the Section Archivist. AUGUSTUS B. WADSWORTH, M.D.

TUESDAY, 2:30 P.M.

VITAL STATISTICS SECTION AND AMERICAN
ASSOCIATION OF REGISTRATION
EXECUTIVES*Joint Session—Room G, Convention Hall**Presiding:* R. N. WHITFIELD, M.D., and JOHN T. MARSHALL.*The Completeness of Birth Registration in the United States for 1940.*
ROBERT F. LENHART.*Discussion:* P. K. WHELPTON.*Organization of Vital Statistics Work.* FORREST E. LINDER, PH.D.*Discussion:* MARGUERITE F. HALL, PH.D., and CARL E. BUCK, DR.P.H.*Effect of War on Vital Statistics.* JOHN T. MARSHALL.*Discussion:* HARRY S. MUSTARD, M.D.*Summary of Delayed Registration.* A. W. HEDRICH, SC.D.*Discussion:* TRAVIS P. BURROUGHS, M.D.

LABORATORY AND EPIDEMIOLOGY SECTIONS

*First Joint Session—Room E, Convention Hall**Presiding:* ELLIOTT S. ROBINSON, M.D., and JOHN A. FERRELL, M.D.*The Rôle of Type XIV Pneumococci in Producing Illness.* WILSON G.
SMILLIE, M.D., and OLGA F. JEWETT.*A Study of an Epidemic of Type I Pneumococcus Pneumonia with
Special Reference to Immunization with the Felton Antigen.*
BERNARD F. BLUM, M.D.*Unclassified Pneumococcus Strains in Relation to the Production of
Therapeutic Sera.* GRACE M. SICKLES.*Analysis of Pneumococcal Typing Methods from Results Obtained
with 9,403 Consecutive Specimens.* ANNABEL W. WALTER, GERTRUDE R.
DANGLER, MARIE ROMANO and ANNA R. EISENSTADT.*Antitoxin Formation in Rabbits.* JULES FREUND, M.D.*Recent Studies in the Serological Classification of Hemolytic Strepto-
cocci.* REBECCA C. LANCEFIELD, PH.D.

LABORATORY

*Second Session—Room D, Convention Hall**Presiding:* JAMES GIBBARD.*The Influence of Wetting Agents upon the Action of Various Anti-
septics.* C. VIRGINIA FISHER, PH.D.*The Value of the Self-Antiseptic Properties in Clothing.* L. H. JAMES,
PH.D.

TUESDAY, 2:30 P.M.

LABORATORY (Cont.)

Second Session—Room D, Convention Hall

Use and Abuse of *Staphylococcus Aureus* as a Test Organism.
C. M. BREWER, PH.D.

The Relative Toxicity of Certain Antiseptics Containing Soap and Alcohol with Special Reference to Mouth Washes. HENRY WELCH, PH.D., and C. M. BREWER, PH.D.

Bacteriologic Study of Radiant Disinfection of Air in the Control of Epidemic Spread of Contagion. WILLIAM F. WELLS AND RICHARD GREEN.

HEALTH OFFICERS, FOOD AND NUTRITION, MATERNAL
AND CHILD HEALTH, AND PUBLIC HEALTH
NURSING SECTIONS, AND AMERICAN
SCHOOL HEALTH ASSOCIATION

Joint Session—Room F, Convention Hall

Presiding: EARLE G. BROWN, M.D., A. C. HUNTER, PH.D., ESTELLA FORD WARNER, M.D., RUTH HOULTON, R.N., and AMOS L. BEAGHLER, M.D.

NUTRITION IN NATIONAL DEFENSE

Two Years' Experience in a Nutrition Program for National Defense.
FREDERICK F. TISDALL, M.D.

Marshalling Our Resources for Better Nutrition of the Civilian Population. HELEN S. MITCHELL, PH.D.

State Nutrition Program for National Defense. ANNA DEPLANTER BOWES

Working for Better Nutrition in a Rural Community. W. R. WILLARD, M.D.

Nutrition in a City Health Program. MARION H. DOUGLAS, R.N.

ENGINEERING

First Session—Room H, Convention Hall

Presiding: HARRY B. HOMMON.

Housing the Poor. CHARLES L. SENN.

Municipal Sanitation. MARTIN A. POND, M.P.H.

Discussion: GILBERT L. KELSO.

New Methods of Hookworm Disease Control. JUSTIN M. ANDREWS, SC.D.

The Work of the Sanitary Corps of the United States Army. W. A. HARDENBERGH.

Revision of the Drinking Water Standards. J. K. HOSKINS, C.E.

TUESDAY, 2:30 P.M.**PUBLIC HEALTH EDUCATION***First Session—Room C, Convention Hall**Presiding:* THOMAS G. HULL, Ph.D.**HEALTH EDUCATION APPRAISAL****Health Education: An Appraisal.** DONALD B. ARMSTRONG, M.D.**South of the Rio Grande:***Health Education in Mexico.* ANGEL DE LA GARZA BRITO, M.D.*Observations on a Recent Trip.* MARY E. MURPHY.**The Modern Public Opinion Poll—A Means of Defining and Appraising Community Health Education Problems.** PAUL D. GUERNSEY.**TUESDAY, 8:30 P.M.****FIRST GENERAL SESSION***Ball Room, Convention Hall**Presiding:* W. S. LEATHERS, M.D., *President*, American Public Health Association.**Addresses of Welcome—Introductions by the Chairman of the Local Committee,** HONORABLE THOMAS D. TAGGART, JR.**Presidential Address.** JOHN L. RICE, M.D., *President-elect*, American Public Health Association.**Address.** THE RIGHT HONORABLE MALCOLM MACDONALD.*Announcement of Sedgwick Memorial Medal Award.**Reception to the President and President-elect.**Dancing.***WEDNESDAY, 8:00 A.M.****AMERICAN SCHOOL HEALTH ASSOCIATION***Breakfast Session—Room C, Hotel Chelsea**Presiding:* A. O. DEWEESE, M.D.**Section on School Hygiene in the American Public Health Association.***Discussion Leader:* CHARLES H. KEENE, M.D.**HARVARD UNIVERSITY ALUMNI***Breakfast Session—Submarine Grill, Hotel Traymore*

WEDNESDAY, 8:00 A.M.

JOHNS HOPKINS UNIVERSITY ALUMNI

Breakfast Session—Rose Room, Hotel Traymore

YALE UNIVERSITY ALUMNI

Breakfast Session—Belvedere Room, Hotel Traymore

WEDNESDAY, 9:30 A.M.

LABORATORY AND EPIDEMIOLOGY SECTIONS

Second Joint Session—Room II, Convention Hall

Presiding: ELLIOTT S. ROBINSON, M.D., and JOHN A. FERRELL, M.D.

Recent Studies in Influenza. FRANK L. HORSTALL, JR., M.D.

Epidemiological Observations in the Halifax Epidemic. STAFFORD M. WHEELER, M.D.

Contagious Diseases in Adult Groups. G. D. W. CAMERON, M.D.

Epidemiological Observations in War-Time London. JOHN E. GORDON, M.D.

LABORATORY AND ENGINEERING SECTIONS

Joint Session—Room A, Convention Hall

Presiding: JAMES GIBBARD and HARRY B. HOMMON.

Report of the Standard Methods Committee on Examination of Water and Sewage. *Chairman,* W. L. MALLMANN, PH.D.

Report of the Standard Methods Committee on Examination of Shellfish. *Chairman,* JAMES GIBBARD.

Methods for the Examination of Shellfish and Shellfish Producing Waters. LESLIE A. SANDHOLZER, PH.D.

Studies on Aberrant Coliform Bacteria. LELAND W. PARR, PH.D., and HAROLD FRIEDLANDER.

Present Status of Tests for Organic Pollutational Loads. A. M. BUSWELL, PH.D.

Stabilization of Chlorine in Water. JOHN E. MILLER, W. L. MALLMANN, PH.D., and E. D. DEVEREAUX.

Bubbling Drinking Fountains. LIEUTENANT COLONEL A. PARKER HITCHENS, M.D., and OSCAR I. ROSENTHALL.

Mosquito Control in Impounded Waters. T. J. HEADLEE, PH.D.

WEDNESDAY, 9:30 A.M.

FOOD AND NUTRITION, AND MATERNAL AND CHILD
HEALTH SECTIONS, AND AMERICAN SCHOOL
HEALTH ASSOCIATION*First Joint Session—Room F, Convention Hall**Presiding:* A. C. HUNTER, PH.D., ESTELLA FORD WARNER, M.D., and AMOS L. BEAGHLER, M.D.PLANNING THE NUTRITION CONTENT OF A SCHOOL HEALTH
PROGRAM IN A RURAL AREA*Discussion Panel:*

The School Medical Coördinator for the State. GEORGE M. WHEATLEY, M.D.

County Superintendent of Schools. CALVIN SMITH.

County Health Officer. PAUL R. ENSIGN, M.D.

County Nurse. OPAL REAGAN, R.N.

Representative of the County Medical Society. J. LOUIS NEFF.

State Nutritionist from the Maternal and Child Health Division of the State Health Department. CATHERINE LEAMY.

Home Demonstration Agent of the United States Department of Agriculture. MARIE DOERMANN.

County Red Cross Executive Secretary and Representative of the Welfare Department. MARGARET LEWIS.

Classroom Teacher. FLORENCE C. O'NEILL.

HEALTH OFFICERS AND PUBLIC HEALTH EDUCATION
SECTIONS*Joint Session—Room E, Convention Hall*

COMMUNITY ORGANIZATION FOR HEALTH EDUCATION

Presiding: C. E. TURNER, DR.P.H.

Discussion of the Results of the Report of the Committee by the Same Name.

Participants:

E. R. COFFEY, M.D.

JESSIE M. BEERMAN, M.D.

MAYHEW DERRYBERRY, PH.D.

IRA V. HISCOCK, Sc.D.

DELBERT OBERTLUFFER, PH.D.

PHILIP L. RILEY

JOHN J. SIPPY, M.D.

HENRY F. VAUGHAN, DR.P.H.

HAROLD H. WALKER, PH.D.

WEDNESDAY, 9:30 A.M.

PUBLIC HEALTH NURSING

First Session—Room D, Convention Hall

Presiding: RUTH HOULTON, R.N.

Report of the Committee on Membership. *Chairman,* NAOMI DEUTSCH, R.N.

Report of the Committee to Study Duties of Nurses in Industry. *Chairman,* OLIVE WHITLOCK, R.N.

Report of the Committee to Study Relationships Between Official and Nonofficial Agencies. *Chairman,* JULIA L. GROSCOP, R.N.

Section Business.

Reports of Activities of A.P.H.A. Committees on which the Public Health Nursing Section has representation:

Administrative Practice. MARION W. SHEAHAN, R.N.

Professional Education. PEARL McIVER, R.N.

Eligibility. AGNES J. MARTIN, R.N.

Research and Standards. MARGARET G. ARNSTEIN, R.N.

Nominating Committee for Governing Council Members. MARIAN G. RANDALL, R.N.

VITAL STATISTICS

First Session—Room G, Convention Hall

Presiding: R. N. WHITFIELD, M.D.

Section Business.

Report of the Committee on Accident Statistics. *Chairman,* ROBERT J. VANE.

Report of the Committee to Revise the Committees on Forms and Methods of Statistical Practice and Utilization of Vital Statistics Data During the 1940 Census Period. *Chairman,* SELWYN D. COLLINS, PH.D.

Report of Committee for the Study of Methods of Estimating Population. *Chairman,* J. V. DEPORTE, PH.D.

Report of the Committee on Master Plans for WPA Projects. *Chairman,* HALBERT L. DUNN, M.D.

Willingness of Individuals to Be Examined for Tuberculosis. GAUIS E. HARMON, M.D.

Discussion: GODIAS J. DROLET.

The Identification of Unknown Dead. WILLIAM C. WELLING.

Discussion: WALTER R. SCOTT.

WEDNESDAY, 9:30 A.M.

INDUSTRIAL HYGIENE

Second Session—Room C, Convention Hall

Relationship of Industrial Visual Defect to Efficiency of Production in Defense Effort. HEDWIG S. KUHN, M.D.

Blood Lead Determinations as a Health Department Laboratory Service. JOHN M. McDONALD, M.D., and EMANUEL KAPLAN, Sc.D.

The Comparison of Methods for the Determination of Carbon Monoxide in Air. F. H. GOLDMAN, Ph.D., and ALLEN D. BRANDT, Sc.D.

Health and Working Environment of Non-Ferrous Metal Mine Workers. WALDEMAR C. DREESSEN, M.D., RICHARD T. PAGE and HUGH P. BRINTON, Ph.D.

WEDNESDAY, 11:30 A.M.

THE STAKE OF PUBLIC HEALTH IN THE NEW SOCIAL WELFARE

Second General Session—Ball Room, Convention Hall

Presiding: SELSKAR GUNN, *Vice-President*, American Public Health Association.

What Is Happening to Social Gains of the Last Ten Years? MARY VAN KLEECK.

The Interrelationship of Health and Welfare in the Emergency. HONORABLE WILLIAM J. ELLIS.

WEDNESDAY, 12:30 P.M.

INDUSTRIAL HYGIENE

Luncheon Session—Stratosphere Room, Hotel Traymore

Report of the Committee on Lead Poisoning. *Chairman*, ROBERT A. KEHOE, M.D.

Report of the Committee on Pneumoconiosis. *Chairman*, R. R. SAYERS, M.D.

Report of the Committee on Industrial Anthrax. *Chairman*, HENRY FIELD SMYTH, M.D.

Report of the Committee on Standard Methods for the Examination of Air. *Chairman*, EMERY R. HAYHURST, M.D.

Report of the Subcommittee on Chemical Procedures. *Chairman*, F. H. GOLDMAN, Ph.D.

Report of the Subcommittee on Physical Procedures. *Chairman*, CONSTANTIN P. YAGLOU.

Report of the Subcommittee on Bacteriological Procedures. *Chairman*, WILLIAM F. WELLS.

WEDNESDAY, 12:30 P.M.

AMERICAN SCHOOL HEALTH ASSOCIATION

Luncheon Session—Como Hall, Hotel Chelsea

Presiding: HAROLD H. MITCHELL, M.D.

Nutritional Studies. CARROLL E. PALMER, M.D.

Discussion. WILLIAM G. SCHMIDT, M.D.

DELTA OMEGA

Luncheon Session—Rose Room, Hotel Traymore

ORAL HEALTH GROUP

Luncheon Session—Belvedere Room, Hotel Traymore

How Important Is the Dental Health Program? Nationally? Locally?
IRA V. HISCOCK, Sc.D.

WEDNESDAY, 2:30 P.M.

HEALTH OFFICERS

Second Session—Room D, Convention Hall

SYMPOSIUM ON CANCER

Cancer as a Public Health Problem. EARLE G. BROWN, M.D.

Present Status of Treatment of Cancer. SHIELDS WARREN, M.D.

Present Status of Research in Cancer. CARL VOEGTLIN, Ph.D.

Present Status of State Cancer Control Programs. L. A. SCHEELE, M.D.

PUBLIC HEALTH EDUCATION SECTION AND AMERICAN
SCHOOL HEALTH ASSOCIATION

Joint Session—Room C, Convention Hall

Presiding: JOHN SUNDWALL, M.D.

SCHOOL HEALTH INFORMATION, PLEASE?

Chairman: ARTHUR R. TURNER, M.D.

Board of Experts:

SALLY LUCAS JEAN, Administration

CHARLES C. WILSON, M.D., Physical Education

EARL E. KLEINSCHMIDT, M.D., Health Service

ALICE V. KELIHER, Ph.D., Health Instruction (city)

RUTH E. GROUT, Ph.D., Health Instruction (rural)

W. CARSON RYAN, Ph.D., Mental Hygiene

WEDNESDAY, 2:30 P.M.

LABORATORY

*Third Session—Room E, Convention Hall**Section Business.*AN OPEN MEETING OF THE STANDARD METHODS COMMITTEE ON
DIAGNOSTIC PROCEDURES AND REAGENTS*Presiding:* WILLIAM D. STOVALL, M.D., *Chairman.*

Gonorrhea and the Gonococcus. CHARLES M. CARPENTER, M.D.

Laboratory Diagnosis of Diphtheria. MARTIN FROBISHER, JR., Sc.D.

Laboratory Diagnosis of Rabies. THOMAS F. SELLERS, M.D.

Laboratory Methods for the Diagnosis of Fungus Diseases. WILLIAM D. STOVALL, M.D.

Meningitis and Meningococcus. SARA E. BRANHAM, M.D.

Recognition and Significance of Hemolytic Streptococci in Infectious Diseases. JULIA M. COFFEY.

Recognition of Pneumococcus Types Associated with Pneumonia. WHEELAN D. SUTLIFF, M.D.

Serological and Bacteriological Procedures in the Diagnosis of Enteric Fevers. MARION B. COLEMAN.

Serological, Bacteriological and Other Biological Procedures in the Diagnosis of Undulant Fever. LIEUTENANT COLONEL A. PARKER HITCHENS, M.D.

Serological Tests for the Diagnosis of Syphilis. RUTH GILBERT, M.D.

Studies on the Toxicity of Dyes for Bacteria. EDMUND K. KLINE, Dr.P.H.

Tuberculosis and the Tubercle Bacillus. A. L. MACNABB, D.V.M.

Typhus Fever and Laboratory Methods for Its Recognition. HENRY WELCH, Ph.D.

Whooping Cough and H. Pertussis. PEARL L. KENDRICK, Sc.D.

INDUSTRIAL HYGIENE AND PUBLIC HEALTH NURSING
SECTIONS*Joint Session—Room G, Convention Hall**Presiding:* WILLIAM J. MCCONNELL, M.D., and RUTH HOULTON, R.N.

HEALTH SERVICES FOR THE SMALL PLANT

Engineering Services. JOHN BUXELL.

Medical Services. CRIT PHARRIS, M.D.

Nursing Services. RUTH M. SCOTT, R.N.

Absenteeism Follow-Up by the Nurse. MARY E. GLENN, R.N.

WEDNESDAY, 2:30 P.M.

FOOD AND NUTRITION

Second Session—Room A, Convention Hall

NUTRITION RESEARCH

Urgent Problems in Nutrition Research for National Betterment.
W. H. SEBRELL, JR., M.D.

A Three Year Study on Male Children Receiving Evaporated Milk
and Vitamin Supplement. TERESA FOLIN RHOADS, M.D., MILTON RAPO-
PORT, M.D., and JOSEPH STOKES, JR., M.D.

Biotin—A New Member of the Vitamin B Complex. VINCENT DU-
VIGNEAUD, M.D.

Proteins: The Effect of Vitamins on the Biological Value of Proteins.
JOHN R. MURLIN, PH.D.

Report of the Committee on Assay of Foods. *Chairman*, HENRY T.
SCOTT, PH.D.

Section Business

ENGINEERING AND FOOD AND NUTRITION SECTIONS

Joint Session—Room F, Convention Hall

Presiding: HARRY B. HOMMON and A. C. HUNTER, PH.D.

SANITATION

The Sanitary Significance of the House Fly (*Musca Domestica*) as a
Vector of Food Poisoning Organisms in Food Producing Establish-
ments. MORRIS OSTROLENK and HENRY WELCH, PH.D.

Report of the Committee on Disinfection of Dishes and Utensils.
Chairman, WALTER D. TIEDEMAN, M.C.E.

Discussion: GEORGE J. HUCKER, PH.D., *Chairman*, Committee on Food
Utensil Sanitation.

U. S. Public Health Service Restaurant Sanitation Program. A. W.
FUCHS, C.E.

The Sanitation and Bacteriology of Public Eating Utensils. MURRAY P.
HORWOOD, PH.D., and P. J. PESARE, C.P.H.

Food Establishment Sanitation in a Municipality. FERDINAND A.
KORFF.

EPIDEMIOLOGY

Second Session—Room H, Convention Hall

SYMPOSIUM ON SYPHILIS

The Epidemiology of Syphilis Based Upon Five Years' Experience
in an Intensive Program in New York State. W. A. BRUMFIELD,
JR., M.D., JAMES H. LADE, M.D., and LOUIS FELDMAN.

WEDNESDAY, 2:30 P.M.

EPIDEMIOLOGY (Cont.)

Second Session—Room H, Convention Hall

Study of the Prevalence of Syphilis in the Eastern Health District Based on Specific Age Groups of an Enumerated Population. E. GURNEY CLARK, M.D., and THOMAS B. TURNER, M.D.

Epidemiological Problems Associated with the Rapid Intensive Treatment of Early Syphilis. EVAN W. THOMAS, M.D.

Venereal Disease Problems in National Defense Areas. FRANCIS J. WEBER, M.D.

Epidemiological Methods Used in the Control of Venereal Diseases in New York City. THEODORE ROSENTHAL, M.D., and HERMAN GOODMAN, M.D.

Syphilis in Alabama as Revealed by a Serologic Survey of Selective Service Registrants. D. G. GILL, M.B., D.P.H., W. H. Y. SMITH, M.D., and S. R. DAMON, Ph.D.

WEDNESDAY, 6:30 P.M.

ENGINEERING SECTION, CONFERENCE OF STATE
SANITARY ENGINEERS, AND CONFERENCE OF
MUNICIPAL PUBLIC HEALTH ENGINEERS*Annual Engineers' Stag Dinner—Rose Room, Hotel Traymore*

PNEUMONIA CONTROL OFFICERS

Dinner Session—Stratosphere Room, Hotel Traymore

PUBLIC HEALTH EDUCATION

*Dinner Session—Belvedere Room, Hotel Traymore**Section Business.*

Report of the Committee on School Health Policies. *Chairman,* EDNA A. GERKEN, C.P.H.

Report of the Committee for the Study of State Administration of Public Health Education. *Chairman,* BURT R. RICKARDS.

Report of the Committee on Coördination of Activities. *Chairman,* CARL A. WILZBACH, M.D.

Report of the Committee on Community Organization for Health Education. *Chairman,* C. E. TURNER, DR.P.H.

Report of the Committee to Study the Work of the Section. *Chairman,* DAVID B. TREAT.

"Credit Lines" Department of the American Journal of Public Health. DONALD B. ARMSTRONG, M.D., and JOHN LENTZ.

THURSDAY, 8:00 A.M.

AMEROPS

Breakfast Session—Chippendale Room, Hotel Traymore

AMERICAN SCHOOL HEALTH ASSOCIATION

*Breakfast Session—Room C, Hotel Chelsea**Presiding: AMOS L. BEAGHLER, M.D., President.**Committee Reports:**Tuberculosis**Professional Education**Physical Fitness**Nominating**Summary*

GEORGE PEABODY COLLEGE FOR TEACHERS ALUMNAE

Breakfast Session—Submarine Grill, Hotel Traymore

MASSACHUSETTS INSTITUTE OF TECHNOLOGY ALUMNI

Breakfast Session—Belvedere Room, Hotel Traymore

UNIVERSITY OF MICHIGAN ALUMNI

Breakfast Session—Rose Room, Hotel Traymore

THURSDAY, 9:30 A.M.

FOOD AND NUTRITION

Third Session—Room H, Convention Hall

METALS

*Public Health Relationships of Acute and Chronic Toxicity. FLOYD DE-EDS, PH.D.**Methyl Bromide as a Fumigant for Foods. H. C. DUDLEY, PH.D., and PAUL A. NEAL, M.D.**Aluminum in Foods. GERALD J. COX, PH.D.**Trace Elements in Foods. H. O. CALVERY, PH.D.**An Outbreak of Fluoride Poisoning. HOLLIS S. INGRAHAM, M.D., and ANTHONY J. FLOOD, M.D.*

THURSDAY, 9:30 A.M.

LABORATORY

Fourth Session—Committee Room 11, Convention Hall

Immunological Reactions in Rickettsial Diseases with Special Reference to the Time of Appearance of Antibodies. FLORENCE K. FITZPATRICK and BETTYLEE HAMPIL, Sc.D.

Complement-Fixation in Rickettsial Diseases. IDA A. BENGTSON, Ph.D., and NORMAN H. TOPPING, M.D.

Experimental Studies on Treatment of Wounds in Rabies. HOWARD J. SHAUGHNESSY, Ph.D., and JOSEPH ZICHIS, Ph.D.

Some Problems in the Diagnosis of Rabies. WILLIAM D. STOVALL, M.D.

Studies on the Single Injection Method of Canine Rabies Vaccination. HARALD N. JOHNSON, M.D., and CHARLES N. LEACH, M.D.

An Improved Non-Virulent Rabies Vaccine. LESLIE T. WEBSTER, M.D., and J. CASALS, M.D.

LABORATORY

Fifth Session—Room G, Convention Hall

Presiding: JAMES GIBBARD.

Identification of Bovine Mastitis Streptococci by Serological Methods. WAYNE N. PLASTRIDGE, Ph.D.

The Use of Laboratory Pasteurization in Solving Milk Problems. ELIAS B. BOYCE.

Bacteriological Indices of Quality of Market Cream. ELIZABETH D. ROBINTON, EARLE K. BORMAN, and FRIEND LEE MICKLE, Sc.D.

Experiences with Scharer's Test for the Efficiency of Pasteurization. J. WYLLIE, M.B., D.P.H.

Methods for Determining the Sanitary Quality of Butter. H. C. OLSON, Ph.D.

ENGINEERING SECTION AND NEW JERSEY SECTION
OF THE AMERICAN WATER WORKS ASSOCIATION*First Joint Session—Room C, Convention Hall*

Presiding: HARRY B. HOMMON.

Water Demands and Sewage Production in Military Cantonments. S. M. ELLSWORTH.

Sewage Disposal Problems at Army Camps. PAUL HANSEN.

Informal Report. Recent Activities and Findings of the National Technological Civil Protection Committee. ABEL WOLMAN, DR.ENG.

Viability and Destruction of *Endamoeba Histolytica*. S. L. CHANG, M.D.

The Occurrence and Recovery of the Virus of Infantile Paralysis from Water. JOHN R. PAUL, M.D., and JAMES D. TRASK, M.D.

THURSDAY, 9:30 A.M.

HEALTH OFFICERS

*Third Session—Room E, Convention Hall**Presiding:* MAJOR F. ADAMS, M.B., D.P.H.

The Cost of Various Phases of Public Health Service. W. F. WALKER, DR.P.H., F. J. UNDERWOOD, M.D., and W. C. WILLIAMS, M.D.

Adaptation of Public Health Programs to Defense Needs. JOSEPH W. MOUNTIN, M.D.

Housing as a Health Officer's Opportunity. HUNTINGTON WILLIAMS, M.D.

The Control of Communicable Diseases. HAVEN EMERSON, M.D.

Syphilis and Gonorrhea in New Jersey Draftees. DANIEL BERGSMA, M.D.

Improving Local Health Programs through the Health Conservation Contest. L. VAN D. CHANDLER.

VITAL STATISTICS AND EPIDEMIOLOGY SECTIONS

*Joint Session—Room D, Convention Hall**Presiding:* R. N. WHITFIELD, M.D., and JOHN A. FERRELL, M.D.

FAMILY STUDIES

The Index Person in Family Studies. LOWELL J. REED, PH.D.

The Health Officer and the Family. GEORGE H. RAMSEY, M.D.

The Importance of Chronic Disease in Family Studies of Illness. JEAN DOWNES.

Use of the Index Case in the Study of Tuberculosis in Williamson County, Tennessee. RUTH R. PUFFER, JAMES A. DOULL, M.D., WILLIAM J. MURPHY, M.D., R. S. GASS, M.D., and W. C. WILLIAMS, M.D.

Discussion. HOWARD C. STEWART, M.D., and JAMES A. DOULL, M.D.PUBLIC HEALTH EDUCATION SECTION AND THE
COMMITTEE ON THE HYGIENE OF HOUSING*Joint Session—Room F, Convention Hall**Presiding:* ABEL WOLMAN, DR.ENG.WHAT CAN WE, AS HEALTH EDUCATORS, TELL THE PUBLIC NOW
ABOUT HEALTHFUL HOUSING?*Participants:*

Rollo H. Britten

BLEECKER MARQUETTE

GLADYS A. LAFETRA

HUNTINGTON WILLIAMS, M.D.

THURSDAY, 9:30 A.M.

PUBLIC HEALTH NURSING

Second Session—Room B, Convention Hall

Public Health Nursing in National Defense. KATHARINE TUCKER, R.N.

Discussion.

Inducting Personnel into the Defense Program. Speaker to be announced.

Doing Public Health Nursing in a Defense Area. Speaker to be announced.

Discussion.

INDUSTRIAL HYGIENE

*Third Session—Room A, Convention Hall*The Toxicity of Toluene and the Mechanism of Its Action.
WOLFGANG F. VON OETTINGEN, M.D., PAUL A. NEAL, M.D., and DENNIS D. DONAHUE, Sc.D.

Toluol—A Study of Its Toxicity. LEONARD GREENBURG, M.D., MAY R. MAYERS, M.D., HARRY HEIMANN, M.D., and SAMUEL MOSKOWITZ, Ph.D.

Methanol Poisoning. I. Exposure of Dogs to 500 p.p.m. Methanol Vapor in Air. R. R. SAYERS, M.D., WILLIAM P. YANT, and HELMUTH H. SCHRENK, Ph.D.

THURSDAY, 12:30 P.M.

FOOD AND NUTRITION

*Luncheon Session—Submarine Grill, Hotel Traymore*Report of the Committee on Microbiological Examination of Foods.
Chairman, HARRY E. GORESLINE, Ph.D.Report of the Committee on Foods (Except Milk). *Chairman*,
BERNARD E. PROCTOR, Ph.D.Report of the Committee on Membership and Fellowship. *Chairman*,
ABRAHAM LICHTERMAN, Ph.D.Report of the Coördinating Committee. *Chairman*, F. C. BLANCK, Ph.D.Report of the Committee on Food Utensil Sanitation. *Chairman*,
GEORGE J. HUCKER, Ph.D.

COMMITTEE ON PROFESSIONAL EDUCATION

Luncheon Session—Rose Room, Hotel Traymore

Program to be announced.

THURSDAY, 2:00 P.M.

CONFERENCE OF STATE DIRECTORS OF LOCAL
HEALTH SERVICES*Stratosphere Room, Hotel Traymore*

THURSDAY, 7:00 P.M.

THIRD GENERAL SESSION

*Annual Banquet—Grand Ball Room, Hotel Traymore**Presiding:* W. S. LEATHERS, M.D., *President, American Public Health Association.**Presentation of Forty Year Membership Certificates.**Announcement of Health Conservation Contest Awards.**Entertainment.**Dancing.*

FRIDAY, 9:30 A.M.

HEALTH OFFICERS

*Fourth Session—Room E, Convention Hall*CLINIC ON ADMINISTRATIVE TECHNICS IN LOCAL HEALTH
PROGRAMS

An informal discussion to which all are invited and in which anyone
may participate

Presiding: EARLE G. BROWN, M.D.*Interlocutor:* ABEL WOLMAN, DR.ENG.*Referee:* W. F. WALKER, DR.P.H.

Methods and Technics Used in the Development of Full-time Rural
Health Service in Canada. C. J. W. BECKWITH, M.D.

Why My Program of Maternity Hygiene Is More Effective than the
Average Program. EARL P. BOWERMAN, M.D.

The Technics Which Make Our Venereal Disease Control Program
Click. R. K. WILSON, M.D.

The Little, but Different Things We Do Which Seem to Make Our
Tuberculosis Control Program Successful. SUE H. THOMPSON, M.D.

How to Organize and Conduct a Program of Public Health Dentistry
Which Will Actually Reach Children of Preschool Age. LEON R.
KRAMER, D.D.S.

How to Increase Local Appropriations for Local Public Health Work.
CHARLES D. CAWOOD, M.D.

Why I Am Proud of Our Plan for Milk Control and Supervision.
ARTHUR H. WILLIAMSON, D.V.M.

FRIDAY, 9:30 A.M.

LABORATORY

*Sixth Session—Room D, Convention Hall**Presiding:* JAMES GIBBARD.

Antigenic Structure of H. Pertussis and Clinical Significance. EARL W. FLOSDORF, PH.D., and AIMES C. MCGINNESS, M.D.

The Nasopharyngeal Swab in the Diagnosis of Pertussis. T. M. SAITO and JOHN J. MILLER, JR., M.D.

The Use of Alum Treated Pertussis Vaccine and of Alum Precipitated Combined Diphtheria Toxoid and Pertussis Vaccine for Active Immunization. PEARL L. KENDRICK, SC.D.

Simultaneous Administration of Diphtheria Toxoid and Pertussis Vaccine in Young Children. LOUIS W. SAUER, M.D., and WINSTON H. TUCKER, M.D.

Synthetic Medium for Differentiation of Salmonella, Klebsiella and Neisserian Organisms. SARA A. SCUDDER.

Study of Atypical Enteric Organisms of the Shigella Group. ELIZABETH J. COPE and KEITH KILANDER.

FOOD AND NUTRITION AND LABORATORY SECTIONS

*Joint Session—Room B, Convention Hall**Presiding:* A. C. HUNTER, PH.D., and ELLIOTT S. ROBINSON, M.D.

Report of the Standard Methods Committee on Examination of Dairy Products. *Chairman*, ROBERT S. BREED, PH.D.

Report of the Standard Methods Joint Committee on Analyzing Frozen Desserts and Ingredients. *Chairman*, FRIEND LEE MICKLE, SC.D., and *Chairman*, FREDERICK W. FABIAN, PH.D.

Rôle of Acid Cleaners in Dairy Sanitation. MILTON E. PARKER.

Administrative Public Health Problems in Milk and Milk Products. LLOYD ARNOLD, M.D.

Quality Control in the Manufacture of Butter. B. W. HAMMER, PH.D.

ENGINEERING

Second Session—Room G, Convention Hall

Decomposition of Land Fill Material. ROLF ELIASON.

Weeds, Waste and Hay Fever. R. P. WODEHOUSE, PH.D.

The Time Factor in Chlorine and Chloramine Disinfection of Contaminated Swimming Pool Waters. EMIL T. CHANLETT and HAROLD B. GOTAAS.

FRIDAY, 9:30 A.M.

VITAL STATISTICS

Second Session—Room A, Convention Hall

The Use of Vital Records in the Reduction of Fetal, Infant and Maternal Mortality. THOMAS J. DUFFIELD.

Discussion: JACOB YERUSHALMY, PH.D.

Evaluation of State Vital Statistics Reports. W. THURBER FALES, SC.D.

Discussion: JOHN H. WATKINS, PH.D., and THOMAS W. CHAMBERLAIN.

Put Your Accident Information to Work. W. G. JOHNSON.

Discussion: ROBERT J. VANE.

Error in Death Statistics (based on 20,000 clinical and post-mortem records). HAVEN EMERSON, M.D., and KURT POHLEN, PH.D.

Discussion: EDWIN L. CROSBY, M.D., and EDWIN B. WILSON, PH.D.

INDUSTRIAL HYGIENE

Fourth Session—Room C, Convention Hall

Mental Hygiene in Industry. LYDIA G. GIBERSON, M.D.

Workers' Health Education. ELIZABETH G. PRITCHARD.

The Relationship of Vocational Rehabilitation to Industrial Hygiene. DAVID AMATO.

FOOD AND NUTRITION AND MATERNAL AND CHILD
HEALTH SECTIONS AND THE ORAL HEALTH GROUP*Joint Session—Room F, Convention Hall*

Presiding: A. C. HUNTER, PH.D., ESTELLA FORD WARNER, M.D., and J. M. WISAN, D.D.S.

NUTRITION AND MATERNAL HEALTH

Review of Present-Day Knowledge of Nutrition in Relation to Pregnancy and Lactation. HUGH J. BICKERSTAFF, M.D., NICHOLSON J. EASTMAN, M.D., and ERNESTINE BECKER.

Improving Maternal Health Through Diet. J. HARRY EBBS, M.D.

Effect of Nutrition During Pregnancy on Dental Health of Young Children. FRANCES KRASNOW, PH.D.

Education in Nutrition as Part of the Maternal Health Program. HESTER B. CURTIS, M.D., and CHRISTINE A. HELLER.

Report of the Committee on Nutritional Problems. *Chairman,* MARJORIE M. HESELTINE.

FRIDAY, 9:30 A.M.

EPIDEMIOLOGY

Third Session—Room H, Convention Hall

A Rural Outbreak of Poliomyelitis: The Incidence of Minor Illnesses in the Community and Virus Infection Among Contacts. ALEXANDER D. LANGMUIR, M.D.

A Nutrition Survey of a Small North Carolina Community. D. F. MILAM, M.D.

Effect of New Type of Chemotherapeutic Agent on Experimental and Human Malaria. L. T. COGGESHALL, M.D., and JOHN MAIER, M.D.

Epidemiology of Cancer in the United States and Abroad. S. PELLER, M.D.

A Mock Epidemic of Typhoid Fever Used in Public Health Training. GEORGE B. DARLING, DR.P.H., and LIEUTENANT COLONEL LEON A. FOX, M.D.

AMERICAN SCHOOL HEALTH ASSOCIATION

Second General Session—Convention Hall

ROUND TABLES

Committee Room 1, Convention Hall

Objectives and Scope of a School Health Program in a Rural Area. E. R. SHAFFER, M.D., and REBA F. HARRIS.

Committee Room 2, Convention Hall

Physical Fitness—How Can It Be Attained? CHARLES H. KEENE, M.D.

Committee Room 3, Convention Hall

School Health Examinations—Their Scope and Content. HENRY R. O'BRIEN, M.D., and J. E. BURKE, M.D.

Committee Room 4, Convention Hall

In-Service Training for School Health Personnel. HAROLD H. MITCHELL, M.D., and CHARLES E. SHEPARD, M.D.

Committee Room 5, Convention Hall

School Nursing Relationships. ROSE J. JIRENEC, M.D., and GERTRUDE E. CROMWELL, R.N.

FRIDAY, 11:30 A.M.

PUBLIC HEALTH IN GREAT BRITAIN—RECENT
OBSERVATIONS*Fourth General Session—Ball Room, Convention Hall*

Presiding: W. S. LEATHERS, M.D., *President*, American Public Health Association.

Address. MARTHA M. ELIOT, M.D.

Address. THOMAS PARRAN, M.D.

FRIDAY, 12:30 P.M.

NATIONAL ORGANIZATION FOR PUBLIC HEALTH
NURSING

Luncheon Session—Rose Room, Hotel Traymore

NATIONAL COMMITTEE OF HEALTH COUNCIL
EXECUTIVES

Luncheon Session—Mandarin Room, Hotel Traymore

FRIDAY, 2:30 P.M.

PUBLIC HEALTH NURSING SECTION AND NEW JERSEY
STATE ORGANIZATION FOR PUBLIC HEALTH NURSING

Joint Session—Room E, Convention Hall

Presiding: RUTH HOULTON, R.N.

How the Public Health Nurse Spends Her Time. FRANCES F. HAGAR,
R.N.

"TOWN MEETING"

What Progress Has Been Made in the Coördination of Community
Public and Private Agencies?

Chairman of Discussion: ALMA C. HAUPT, R.N.

Advances Since the National Organization for Public Health Nursing
Survey of 1934. DOROTHY DEMING, R.N.

Discussion.

FOOD AND NUTRITION AND MATERNAL AND CHILD
HEALTH SECTIONS AND THE AMERICAN SCHOOL
HEALTH ASSOCIATION

Second Joint Session—Room D, Convention Hall

Presiding: A. C. HUNTER, PH.D., ESTELLA FORD WARNER, M.D., and AMOS L.
BEAGHLER, M.D.

SCHOOL NUTRITION AND BETTERMENT

Shall Public Health Physicians Attempt to Assess Nutritional Status
of School Children? SUSAN SOUTHER, M.D.

A Nutrition Demonstration as a Tool for Teacher Training. WALTER
WILKINS, M.D., and FRENCH BOYD.

The Functioning School Lunch. MARTHA KOEHNE, PH.D.

The School Health Administrator Looks at the School Lunch Room.
ARTHUR R. TURNER, M.D.

FRIDAY, 2:30 P.M.

LABORATORY

Seventh Session—Room C, Convention Hall

Epidemic Influenza. Epidemiological, Clinical and Laboratory Aspects of 1940-1941 Outbreak in St. Louis. S. EDWARD SULKIN, PH.D., JOSEPH F. BREDECK, M.D., and D. DAVID DOUGLASS.

Influenza in Detroit, 1941. A Report on the Clinical, Epidemiological and Laboratory Findings. F. H. TOP, M.D., and FRED STIMPERT, PH.D.

Chorio-Allantoic Membrane Infection as a Diagnostic Test for Small-pox. S. W. BOHLS, M.D., and J. V. IRONS, Sc.D.

New Aids to the Diagnosis and Epidemiology of Lymphogranuloma Venereum. MORRIS F. SHAFFER, PH.D., and GEOFFREY RAKE, M.B.

LABORATORY AND EPIDEMIOLOGY SECTIONS

Third Joint Session—Room G, Convention Hall

Presiding: ELLIOTT S. ROBINSON, M.D., and JOHN A. FERRELL, M.D.

The Occurrence of Leptospiral Infections in the United States. W. W. STILES, M.D., and GEORGE PACKER BERRY, M.D.

Results of Serologic Tests for Syphilis in Non-syphilitic Persons Inoculated with Malaria. L. E. BURNEY, M.D., J. R. S. MAYS and ALBERT ISKRANT.

Diphtheria Immunization with Fluid Toxoid and Alum Precipitated Toxoid. V. K. VOLK, M.D., and W. E. BUNNEY, PH.D.

Reimmunization of Previously Immunized Children. V. K. VOLK, M.D., and W. E. BUNNEY, PH.D.

Summary of Studies of Diphtheria Bacilli in the United States. MARTIN FROBISHER, JR., Sc.D.

Discussion: DONALD T. FRASER, M.B., D.P.H.

ENGINEERING SECTION AND THE NEW JERSEY SECTION OF THE AMERICAN WATER WORKS ASSOCIATION

Second Joint Session—Room F, Convention Hall

THE TECHNICAL EXHIBITS CONVENTION HALL

EXHIBITORS in the Twenty-Third Health Exhibit, sponsored by the American Public Health Association in connection with its 70th Annual Meeting, describe the exhibits they are preparing for the information of delegates as follows:

ALBA PHARMACEUTICAL COMPANY, INC.

NEW YORK, N. Y. No. 206

ROCCAL, formerly known as ZEPHIRAN INDUSTRIAL, has continued to prove its worth as a sanitizing agent of public eating and drinking utensils. In addition, new applications have been found and are being studied by Public Health Departments throughout the country, for this tasteless, odorless and non-corrosive bactericidal agent in different fields. ROCCAL is a mixture of high molecular alkyl-dimethyl-benzyl-ammonium chlorides. The product is extremely stable in the presence of organic matter. Samples and literature will be available at the booth.

A. S. ALOE COMPANY

ST. LOUIS, MO. Nos. 221 and 223
NEW AND RECENT LABORATORY DEVICES

A complete display of new and recent apparatus for the public health laboratory. New serological water baths for the Kalu Verification Test will be shown as well as additional new equipment of interest to the serologist. New models of spectrophotometers and fluorometers will be demonstrated especially as adapted to vitamins and general analytical procedures. Miscellaneous new items of interest to the public health physician and nurse will also be displayed and demonstrated.

AMERICAN CAN COMPANY

NEW YORK, N. Y. Nos. 418 and 420

Convention delegates are invited to visit Booths 418 and 420 where information is available concerning those aspects of commercially canned foods which are of particular interest to members of the American Public Health Association. The American Can Company's modern, single-service, paper milk container will also be featured. Those who visit the American Can Company's booth will receive an attractive souvenir of the Convention.

AMERICAN HOSPITAL SUPPLY CORPORATION

CHICAGO, ILL. No. 401

The American Iron Lung, an improved respirator, is to be displayed by the American Hospital Supply Corporation. Health Department representatives interested in respiration equipment will find new features in the design of the American Iron Lung which overcome the main objections to former type respirators. Pleasing appearance with maximum comfort to the patient recommends the American Iron Lung for community use. Be sure to examine this modern respirator.

A complete exhibit of Baxter products for blood transfusions, banking, and preparation of blood plasma will be displayed. The modern blood bank is a simple undertaking with Baxter Transfusovacs, Centri-Vacs, and Plasma-Vacs.

AMERICAN INSTRUMENT COMPANY

SILVER SPRING, MD. No. 410

At the exhibit of the American Instrument Company there will be displayed the following: Fermentometers, Fluorophotometers, Spectrophotometers, Reaction Cells, Apparatus for Serological Baths, Test Tube Racks, Incubators, Anaerobic Culture Apparatus, Automatic Pipetting Machines, Colony Counters, Constant Temperature Baths and Equipment and other items of interest to public health workers and officials.

AMERICAN JOURNAL OF NURSING

NEW YORK, N. Y. No. 116

The AMERICAN JOURNAL OF NURSING, official publication of the American Nurses Association, and the National League of Nursing Education, serves nurses throughout the world. It recognizes the interdependence of all health workers. Many public health nurses call it "indispensable," while thousands of others say, "I could never carry on in my work without the Journal."

THE BORDEN COMPANY

NEW YORK, N. Y. No. 413

The Borden Company exhibit will give a graphic portrayal of "The Cost Story Behind A Bottle of Milk." By means of a cleverly illuminated series of illustrated panels, the answers to the ever pertinent question of where the milk dollar goes are presented.

CARNATION COMPANY

OCONOMOWOC, WIS. Nos. 300 and 302

Don't miss the interesting and unique display at Booth Nos. 300 and 302. You will see a quick, complete and highly dramatic presentation of the story of Carnation Quality. Every operation in the processing of Irradiated Carnation Milk—from farm to finished product—is performed right before your eyes. You will enjoy this personally conducted tour through a Carnation evaporating plant.

CHURCH & DWIGHT CO., INC.

NEW YORK, N. Y. No. 307

Church & Dwight Co., Inc. will exhibit Arm & Hammer and Cow Brand Baking Soda in Booth No. 307. In 1846 this Company pioneered in first producing bicarbonate of soda in the Western Hemisphere. This year attendants will demonstrate its value as a tooth powder in cleaning the teeth. Arm & Hammer Bicarbonate of Soda is listed as an acceptable dentifrice by the American Dental Association.

CINCHONA PRODUCTS INSTITUTE, INC.

NEW YORK, N. Y. No. 200

Colored reproductions of malaria plasmodia and publications on the treatment

of malaria with quinine are the main feature of the Exhibit. Thin smear details of *Plasmodium vivax* (benign tertian), *P. malariae* (quartan) and *P. falciparum* (subtertian) are shown in colored enlargements. The originals were prepared under the direction of Dr. C. W. F. Winckel of Amsterdam and will be of interest to clinicians, diagnosticians and epidemiologists. Reprints of the originals, with a detailed key to them, will be available.

CLAY-ADAMS COMPANY, INC.

NEW YORK, N. Y. No. 212

The Clay-Adams Company, New York, exhibit will be in two divisions. One part will demonstrate supplies for laboratory work and will feature Angle Centrifuges as well as the regular type Centrifuges, Concavity Slides for Klein tests, American made microscope cover glasses, Slides, Slide Boxes, a new laboratory counter for a differential white cell count, new blood smear slides and other laboratory specialties.

The other part of the exhibit will be devoted to Anatomical Models, Charts, Skeletons and Obstetrical Manikins for educational work and will include the new Model Chase N Hospital Doll. Health Departments planning educational programs in your own city, state, or community will find this visual education demonstration very enlightening.

WARREN E. COLLINS, INC.

BOSTON, MASS. No. 209

Of particular interest to Public Health Administrators is the demonstration of the new Drinker-Collins Duplex Respirator which provides dependable, artificial respiration for two children simultaneously. The Duplex Respirator will be shown in operation with two life-sized models which actually breathe. Of equal interest is the General-Collins Emergency Lung for artificial respiration in cases of gas poisoning, electrical shock and drowning where treatment is required for short periods. Also, the Infant Drinker Respirator and Benedict-Roth Metabolism apparatus will be displayed. We cordially invite your inspection.

F. A. DAVIS COMPANY

PHILADELPHIA, PA. No. 416

A cordial invitation is extended to visit the F. A. Davis Company booth to examine these books: Longhurst's *Tuberculosis Nursing*; Taber's *Cyclopedic Medical Dictionary*, which includes 50,000 words, a complete discussion of drugs, first aid, physical therapy, etc.; Gage and Landon's *Communicable Diseases*; Hull, Wright, and Ely's *Medical Nursing* with its inclusion of dietary management; Galloway's *Handbook on Laboratory Technique*; Longlye's *Laboratory Manual in Bacteriology*; Woodward and Gardner's *Obstetric Management and Nursing* with its excellent section on Home Deliveries. Medical books for reference: Goldberg's *Clinical Tuberculosis*; Bethea's *Materia Medica, Drug Administration, and Prescription Writing*; Mullen's *Handbook of Treatment*.

R. B. DAVIS SALES CO.

HOBOKEN, N. J. No. 312

You are invited to enjoy a drink of delicious cocomalt at Booth 312.

Cocomalt is refreshing, nourishing and of the highest quality. It is fortified with vitamins A, B₁ and D; calcium and phosphorus to aid in the development of strong bones and sound teeth; iron for blood; protein for strength and muscle; carbohydrate for energy.

DIFCO LABORATORIES, INC.

DETROIT, MICH. No. 216

Exhibit of dehydrated culture media prepared according to the formulae of the American Public Health Association's "Standard Methods of Water Analysis" and "Standard Methods for the Examination of Dairy Products," as well as other media of particular interest in public health bacteriology.

Demonstration of Bacto-S S Agar, Bacto-MacConkey Agar and other media for isolation and identification of members of the typhoid-paratyphoid-dysentery group.

THE EATON-DIKEMAN COMPANY

MOUNT HOLLY SPRINGS, PA. No. 409

Qualitative and quantitative filter papers, folded filter papers, E & D lining paper, E & D bibulous paper and bibulous booklets, E & D filtermasse.

J. H. EMERSON COMPANY

CAMBRIDGE, MASS. No. 303

In Booth 303 will be exhibited the Emerson Resuscitator, Inhalator and Aspirator. This unit is outstanding for use in emergency field work and in hospitals for the relief of all forms of asphyxia, caused by gas or drug poisoning, suffocation, drowning, electric shock, and other similar causes. Also included in the exhibit will be the Emerson Adult Respirator, with the new Orthopedic Attachment, the newly developed Infant Respirator-Incubator combination, the Vascular Boot and the Humidox Humidifier.

EVAPORATED MILK ASSOCIATION

CHICAGO, ILL. No. 301

The Evaporated Milk Association will have on display educational materials designed for use by doctors, nurses, nutritionists, and other professional people in public health work. These publications deal with low-cost family feeding, infant care, the school lunch problem, and the preparation of food in quantity. Also available are technical publications and reprints of scientific research on the nutritive value and uses of evaporated milk.

FLORIDA CITRUS COMMISSION

LAKELAND, FLA. No. 102

The Florida Citrus Commission exhibit, modern in design and bright as Florida sunshine, will direct attention to the fact that citrus fruits are a healthful natural food, supplementing and repairing the deficiencies of the usual American diet which is notoriously poor in vitamins and mineral salts and that any dietary habit which will increase the consumption of these valuable fruits should benefit the public health. Educational literature will be available to those registering and refreshing citrus juices will be served.

THE J. B. FORD SALES COMPANY

WYANDOTTE, MICH. No. 411

Wyandotte Products are produced by the world's largest manufacturer of specialized alkalies and cleaning materials. *Wyandotte Steri-Chlor* for sterilizing and deodorizing operations. *Wyandotte Dish-washing Compounds* for hand and machine dishwashing in all kinds of water. *Wyandotte Neosuds* for glass washing. *Wyandotte Detergent* for all four kinds of maintenance cleaning. *Wyandotte Bottle Washing Materials* for washing milk and beverage bottles. Other Wyandotte Products for general cleaning in dairies, bottling plants, hospitals, hotels, schools, and public buildings are available.

GENERAL ELECTRIC X-RAY CORP.

CHICAGO, ILL. No. 505

Once again, this exhibit will feature the G-E Photo-Roentgen Unit, the unit that photographs a fluoroscopic image of the chest on a 4" by 5" film, small enough to cost but a few cents, diagnostic enough to have proven within 2% as accurate as the conventional radiograph for tuberculosis case-finding purposes. This time, you may see the new G-E Photo-Roentgen Unit, designed to make the procedure smoother and speedier and even more accurate.

GERBER PRODUCTS COMPANY

FREMONT, MICH. No. 310

The complete line of Gerber Baby Foods will be on display—dry, pre-cooked Cereal Food, fifteen Strained Foods and ten Junior Foods.

A new infant cereal, Strained Oatmeal, pre-cooked, dried and flaked, will be shown for the first time.

Booklets available for distribution to mothers or patients on special diets as well as professional literature will be sent to registrants, for examination.

THE GILLILAND LABORATORIES, INC.

MARIETTA, PA. No. 415

The Gilliland Laboratories will have on display at Booth No. 415 a complete line of Biological Products. This firm gives special attention to supplying Biological Products to State, City and County Boards of Health, Hospitals and Institutions. The representative in charge of this exhibit will be pleased to answer any inquiries.

JOHN HANCOCK MUTUAL LIFE INSURANCE COMPANY

BOSTON, MASS. No. 406

Display of health posters. First of a series to be supplied periodically to industrial plants and business concerns. Available also to social and health agencies carrying on health educational projects.

HANOVIA CHEMICAL AND MANUFACTURING COMPANY

NEWARK, N. J. No. 504

HYGEIA, THE HEALTH MAGAZINE

CHICAGO, ILL. No. 407

In Booth No. 407 there will be on display copies of *HYGEIA*, The Health Magazine, and various books and pamphlets published by the American Medical Association. Health officers, nurses and public health workers will find in *HYGEIA* informative articles on such phases of health as control of epidemics, home sanitation, medical hygiene, pre-natal care, healthful recreation and kindred subjects.

INTERNATIONAL BUSINESS MACHINES CORPORATION

WASHINGTON, D. C. Nos. 118, 120, AND 122

The newest units of Electric Accounting Machines used by public health agencies will be on display at the International Business Machines Corporation exhibit.

Recent developments in the use of public health statistics, report preparation and accounting work will be demonstrated by specialists in this field.

International Electric Time Recorders and Electromatic, the All-Electric Writing Machine, will also be on display.

You are cordially invited to visit this exhibit of modern business machines and discuss your problems with our representatives.

EAM APPLICATIONS

Statistics—Complete printed statistical tables are automatically prepared from punched cards by the Alphabetical Accounting Machine. These tables include births, deaths, clinic or institution, population and activity, laboratory examinations, nursing activity, morbidity statistics and others. Among the divisions served are Vital Statistics, Epidemiology and Communicable Diseases, Nursing, Industrial Hygiene, Maternal and Child Health, Laboratories, Venereal Disease, Tuberculosis and Cancer Control, Sanitation, Dairy and Food Products and Accounting.

KELLOGG COMPANY

BATTLE CREEK, MICH. No. 516
KELLOGG'S EXHIBIT AT THE A.P.H.A. CONVENTION—1941

Kellogg's ready-to-eat cereals have an important part in the dietary program. Corn Flakes and Rice Krispies are included freely in wheat-free and low residue diets. Pep has been enriched with vitamins B₁ and D. Kellogg's other whole wheat and bran cereals—Wheat Krispies, Krumbles, Shredded Wheat, All-Bran and Bran Flakes—are rich in minerals and vitamin B, too. Reprints covering recent research with bran and nutrition will be available at the Kellogg Exhibit. Winifred B. Loggans is in charge.

LEDERLE LABORATORIES, INC.

NEW YORK, N. Y. Nos. 318, 320, AND 322

Lederle's 4-sectional display will describe by means of colored transparencies and charts the latest therapy for Pertussis, Pneumonia and Tuberculosis Case-Finding.

The first section of the Lederle exhibit will feature the strides made in conquering whooping cough through the use of "Pertussis Antigen (Detoxified) Lederle," supported by findings of Joslin and Christensen (December issue American Journal of Diseases of Children) . . . 94% protection with "Pertussis Antigen (Detoxified) Lederle."

The remarkable decrease of mortality in Pneumonia is described in Section two (Chemotherapy) and in Section three (that devoted to Serotherapy). With the advent of Sulfadiazine it is expected that in the Pneumonia season of 1941, Pneumonia as a cause of death in the United States will have been moved from fifth to sixth or seventh place.

Section four deals with the diagnosis of Tuberculosis by means of the Vollmer Tuberculin Patch Test, which is now used in 34 of the 48 states.

LILY-TULIP CUP CORPORATION

NEW YORK, N. Y. Nos. 306 AND 308
Health Defense through the medium of Lily-Tulip Cups for industrial workers, school children, public use in restaurants, taverns, road stands, bars, military establishments, etc.

How Lily-Tulip Cups lower the incidence of disease in mass feeding.

J. B. LIPPINCOTT COMPANY

PHILADELPHIA, PA. No. 404

New Lippincott books of interest to public health workers will be displayed. These include Tobias' "Essentials of Dermatology," Becker and Obermayer's "Modern Dermatology and Syphilology," and Eliason's "First Aid in Emergencies."

Other books of importance are Zabriskie's "Mother and Baby Care in Pictures," Ensworth and Greenwood's "Pneumonia and its Nursing Care," Habel and Milton's "The Graduate Nurse in the Home" and Hasenjaeger's "Asepsis in Communicable-Disease Nursing." Be sure to see them all.

MACGREGOR INSTRUMENT COMPANY

NEEDHAM, MASS. No. 104

The MacGregor Instrument Company will display a full line of VIM Products including VIM Needles made of Firth-Brearely Stainless Cutlery Steel and VIM Green Emerald Syringes, famous for their velvety action. Also featured will be VIM-ODEN Needles, expressly designed for intradermal injections—a new advance in needles that assures invariably correct punctures. Special working models of VIM Syringes will demonstrate why these Slow-Ground Syringes do not leak or backfire.

THE MACMILLAN COMPANY

NEW YORK, N. Y. No. 323

Communicable Disease Control, by Gaylord Anderson and Margaret Arnstein, a new text written from both the health officer's and the public health nurse's point of view, will be featured at Macmillan Booth No. 323. Other new books on display of special interest will be *Clinical Nursing in Medicine*, by Jensen and Jensen, *Massage in Nursing Care*, 2d Ed., by Jensen-Nelson. *Child Psychology*, by Skinner and Harriman, *Feeding Our Old Fashioned Children*, by Aldrich and Aldrich, *Diet in Sinus Infections and Colds*, 2d Ed., by Ullmann, and *Edith Cavell*, by Helen Judson.

MAICO CO., INC.

MINNEAPOLIS, MINN. Nos. 500 AND 502

The manufacturers of the widely known MAICO audiometers, featuring the uniform Zero Reference Level and the Midget vacuum tube hearing aids are pleased to exhibit a new improved Color Tone Organ. This exhibit features a unique synchronization of color and sound and will enable visitors to measure their hearing acuity in both sound and color. Audiometers designed for public health work and other equipment will be available for inspection and demonstration.

THE MEDICAL BUREAU

CHICAGO, ILL. No. 210

In Booth No. 210, M. Burnice Larson offers the facilities of The Medical Bureau, an organization acting as counselor in problems of medical personnel to physicians, hospital administrators, clinic managers and executives in the medical field. The records of physicians who have specialized in the various branches of medicine or those who have completed their training recently as well as the records of hospital executives, graduate nurses, technicians, social workers and dietitians are available to those interested in the completion or reorganization of their staffs.

MERCK & CO., INC.

RAHWAY, N. J. Nos. 311 AND 313

THE PROGRESS OF CHEMOTHERAPY IN PUBLIC HEALTH WORK

Veneral diseases, pneumonia, and nutritional deficiencies are among the important problems confronting all concerned with public health work. During the thirty years since the introduction of the arsphenamines for the treatment of syphilis, chemotherapy has made great strides in aiding in the solution of these problems.

At the Merck booth, charts are on display and literature is available on Neosarsphenamine in Syphilis, Tryparsamide in Neurosyphilis, Sulfapyridine and Sulfathiazole in Pneumonia and Gonorrhea, and the Vitamins in Nutrition.

MINE SAFETY APPLIANCES COMPANY

PITTSBURGH, PA. No. 305

A wide variety of safety equipment will be on display in the M.S.A. booth. Some of the more important products will be: Gas-detecting and indicating instruments, such as, Carbon Monoxide Detector, Carbon Monoxide Indicator, Carbon Monoxide Alarm, Benzol Indicator, and Explosimeter; dust-counting and sampling apparatus consisting of Midget Impinger, Electrostatic Dust and Fume Sampler, and Dust-Counting Microscope; a complete line of respirators (for dusts, mists, paint, and metal fumes), Gas Masks, Breathing Apparatus, H-H Inhalator; and head protection, first aid kits and materials, including the new Foile Spray Kit, Ear Defenders, and Goggles. Both office and field representatives will be in attendance to demonstrate and discuss the equipment.

NATIONAL CANNERS ASSOCIATION

WASHINGTON, D. C. No. 408

The National Canners Association is the research and service organization of the canning industry. The exhibit background shows some of the scientific activities of the Association, and the educational publications of the Home Economics Division will be featured.

NATIONAL DAIRY COUNCIL

CHICAGO, ILL. No. 215

"A Guide to Good Eating" presents the basic pattern for adequate daily meals as recommended by nutrition authorities. This animated, lighted exhibit bears the Seal of Acceptance of the Council on Foods and Nutrition, American Medical Association.

A model of a physician points to the lighted, colored photographs of the foods in the pattern. The side panel emphasizes the theme of nutrition and national health; "Let us make America strong by making Americans stronger."

NATIONAL LIVE STOCK AND MEAT BOARD

CHICAGO, ILL. No. 208

The exhibit of the National Live Stock and Meat Board will portray Meat as a source of the essential food elements, protein, fats, carbohydrate, calcium, phosphorus, iron, copper and six vitamins with special emphasis on the factors of the vitamin B complex.

NATIONAL PEST CONTROL ASSOCIATION

BROOKLYN, N. Y. No. 403

The National Pest Control Association comprising over 400 of the leading firms of the United States and foreign countries have nothing to sell except good will. Purpose of the exhibit is to present an educational display of household and structural pests, damages done and provide information which will be helpful to Public Health Officials. In attendance at the exhibit will be entomologists, chemists and commercial pest control operators (exterminators, fumigators, termite control operators) who will be prepared to answer questions.

NEW YORK MEDICAL EXCHANGE

New York, N. Y. No. 202

Patricia Edgerly (formerly connected with the United States Public Health Service) will act as medical employment consultant. There will be available for your perusal the biographies of qualified candidates who are interested in relocating, as well as those who are anxious to start their careers in the field of Public Health. A list of existing vacancies and opportunities will also be available. It is important that you consult her. No consultation or registration fee.

OVAL WOOD DISH CORPORATION

TUPPER LAKE, N. Y. No. 122

Exhibit of "RITESPONS and RITE-FORKS" Wooden single service spoons and forks for use in soda fountains, restaurants, roadside stands, etc., etc., in plain unwrapped, wrapped, dispenser packing. Also sanitary dispensing unit for above.

OREGON WASHINGTON

CALIFORNIA PEAR BUREAU

HOOD RIVER, ORE. No. 209

An exhibit of fresh pears showing the varieties on the market in October, November and December and a supply of these to slice up and pass out as samples. Also photos of pear recipes—and a supply of recipe material and educational literature on the nutritional qualities of fresh pears, to pass out to those who visit our booth.

We will have available our colored slides showing recipes of pears in many attractive dishes. Our talking moving picture will also be available to show to interested groups.

PARKE, DAVIS & COMPANY

DETROIT, MICH. No. 100

This year Parke, Davis & Company is celebrating its Seventy-fifth Anniversary, and you will find featured in their striking exhibit certain of their outstanding contributions to medicine. Among these are antisyphilitic agents, such as Maphasen and various Bismuth Preparations; outstanding Biological Products, such as Despeciated Antitoxins, Meningococcus Antitoxin, Tetanus Toxoid, Tuberculin Purified Protein Derivative, Pertussis Vaccine Immunizing (Sauer); and several Adrenalin Chloride Preparations. You are cordially invited to visit this exhibit where you will find several Parke-Davis men who will be more than pleased to explain the meritorious features of these and other products.

PENNSYLVANIA SALT MANUFACTURING COMPANY

PHILADELPHIA, PA. No. 213

Will display Perchlaron, B-K Powder, and B-K General Cleanser.

Perchlaron is a supertest calcium hypochlorite containing not less than 70% available chlorine used for special and auxiliary purposes by water works and sewage plants, for bleaching, swimming pool disinfection, for bacteria control on food handling equipment. Now in dustless form. Packed in 5 lb. packages with handy Kork-N-Seal replaceable cover.

B-K Powder, a hypochlorite, principally used for bacteria control work in milk plants and milk producing farms. Packed in jars with full directions and convenient for lay use. Quick acting and highly soluble.

B-K General Cleanser—A free rinsing, efficient manual cleanser, particularly for use on milk utensils in hard water areas and also for glassware and dishes.

B-K Bottle Compound, an alkali for machine washing of bottles, either soaker type or jet type hydro washers. An efficient alkali of a free rinsing type, produces bright sparkling bottles that are germicidally clean.

PET MILK SALES CORPORATION

ST. LOUIS, MO. Nos. 315, 317, 319, ANN 321

An actual working model of a milk condensing plant in miniature with be exhibited by the Pet Milk Company in Booths 315, 317, 319 and 321. This exhibit offers an opportunity to obtain information about the production of Irradiated Pet Milk and its uses in infant feeding and general dietary practice. Miniature Pet Milk cans will be given to each physician who visits the Pet Milk Booth.

PETROLAGAR LABORATORIES, INC.

CHICAGO, ILL. No. 309

Petrolagar Laboratories, Inc., offer in addition to samples of the five types of Petrolagar, an interesting selection of descriptive literature and complete information on the treatment of constipation.

The S.M.A. Corporation in addition to The Bovinine Company will also be represented at Booth No. 309. Those interested in infant feeding will find new and useful facts pertaining to infants deprived of breast milk.

PHILIP MORRIS & CO. LTD., INC.

NEW YORK, N. Y. No. 422

Philip Morris & Company will demonstrate the method by which it was found that Philip Morris Cigarettes, in which diethylene glycol is used as the hygroscopic agent, are less irritating than other cigarettes. Their representative will be happy to discuss researches on this subject, and problems on the physiological effects of smoking.

PHOTOSTAT CORPORATION

ROCHESTER, N. Y. No. 523

The Photostat Corporation will show at this exhibition apparatus which is of particular interest to public health officials who have the responsibility of maintaining all kinds of health records. Photostat representatives will be on hand to discuss problems, and demonstrate methods, and to answer inquiries concerning the many uses of the Photostat. The Photostat is a simple, practical apparatus for quickly producing, by means of photography, copies of all kinds of documents, commercial papers, maps, charts and drawings—in fact anything drawn, written or printed.

POWERS X-RAY PRODUCTS, INC.

GLEN COVE, N. Y. No. 105

The Powers X-ray Products Exhibit will show photographs of the Powers Rapid X-ray Method for chest x-raying large groups of apparently well persons in operation. The use of paper film in rolls makes possible a speed of 125-150 x-rays per hour. High diagnostic quality, reliability, and economy are features of the Method. Also included will be a comparison study of paper and celluloid films, showing the adequacy of the paper film as a method of "screening out" those in need of medical care or further observation.

RALSTON PURINA COMPANY, INC.
ST. LOUIS, MO. No. 304

Ralston Purina Company, makers of Ralston Wheat Cereal, Ry-Krisp and Shredded Ralston, will display whole grain products. Descriptive literature emphasizing the importance of whole grains in optimal nutrition will be available.

A.P.H.A. members are invited to register for cereal samples, illustrated books giving nutritional information on whole wheat and whole rye, vitamin and mineral charts, and Allergy and Low Calorie diets. Special teaching material available to Public Health Nurses.

RECORDAK CORPORATION

NEW YORK, N. Y. No. 405

The Recordak exhibit consists of the Commercial Recordak, Model Ten Film Reader and Recordak Six Drawer Film File. The Commercial Recordak automatically records loose leaf documents such as record cards on 16mm Recordak Safety Film. The Film Reader enlarges 16mm microfilm records back to original size for reference, and can be used as an enlarger to make facsimile reproductions from the film records. The Recordak Film File retains 576 rolls of 16mm film under scientific conditions.

RUUD MANUFACTURING COMPANY

PITTSBURGH, PA. No. 211

Equipment for high-temperature dishwashing in restaurants will be featured at the exhibit of the Ruud Manufacturing Company, Booth 211. Types of Ruud Automatic Gas Water heaters providing hot water from 160 to 180 degrees will be on display, as well as exhibits demonstrating the bacteria-killing power of hot water at these temperatures.

The "Grease Spotter," a new type of illuminated magnifying glass for detecting grease on poorly-washed glasses will also be demonstrated.

W. B. SAUNDERS COMPANY

PHILADELPHIA, PA. No. 417

The W. B. Saunders Company welcome you to its exhibition at Booth No. 417 of its complete line of books on Medicine, Nursing and Health. Among these will be: Bauer and Hull's Health Education; Bolduan's Public Health and Hygiene (new edition); Boyd's Preventive Medicine; Geiger's Health Officer's Manual; Conrad and Meister's Teaching Procedures in Health Education; Bryan's Art of Public Health Nursing; Stoke's Clinical Syphilology; Stoke's Dermatology and Syphilology; Pelouze's Gonorrhea; and advance material on Miss Grant's new book on Public Health Nursing.

SEALRIGHT CO., INC.

FULTON, N. Y. Nos. 113, 115, ANN 117

SEALRIGHT BOOTH TO FEATURE NOVEL SERVICE IN CONJUNCTION WITH MILK BOTTLE HOOD EXHIBIT

Sealright Co., Inc., manufacturer of milk bottle closures and food containers is featuring this year an educational exhibit which explains the sanitary advantages of its new Hood cap for milk bottles.

As a special accommodation for Convention guests, Sealright is providing an information service in Booths 113, 115 and 117. A receptionist will be available at the Booth throughout the exhibition, who will be pleased to take and deliver

messages for Association members. A Sealright page boy will be on duty for locating members on the floor who have registered at the Sealright Booth.

SEALTEST, INC.

NEW YORK, N. Y. Nos. 201 AND 203

The exhibit of the Sealtest System of Laboratory Protection will explain in dramatic form the work of this organization in dairy products research and in production control of ice cream, milk and other dairy products.

The activities of the Sealtest Laboratory Kitchen, Consumer Service division of the Sealtest System, in promoting the use of dairy products in the home will also be featured.

E. R. SQUIBB & SONS

NEW YORK, N. Y. Nos. 314 AND 316

Visitors attending the American Public Health Association Convention are cordially invited to visit the Squibb Exhibit in Booths 314 and 316. The complete line of Squibb Arsenicals, Biologicals, and Specialties of particular interest to workers in the Public Health field will be featured, together with a number of interesting new items. Well informed representatives will be on hand to welcome you and to furnish any information desired on the products displayed.

STANLEY SUPPLY COMPANY

NEW YORK, N. Y. No. 214

You are cordially invited to visit the "House of Stanley." This year in addition to exhibiting its well known line of Nurse's Leather Bags, the Stanley Supply Company is also featuring a new bag lining that is 16 ounces lighter than the lining in use at present. Many other new items of interest to nurses will also be displayed.

UNITED FRUIT COMPANY

NEW YORK, N. Y. No. 501

At the United Fruit Co. Booth No. 501, you will find an interesting display of the many dishes which can be made with bananas and which can fit into the planning of lower cost meals as well as into school lunch room and cafeteria programs.

Our popular Banana Milk Shake can also be sampled at our booth.

Come and see us! You are cordially invited.

WALLACE & TIERNAN CO., INC.
NEWARK, N. J. Nos. 400 AND 402

Wallace & Tiernan will have as the theme of their exhibit "The Best Home Defense is Health Defense. The Best Health Defense is a Sterilized Water." They will feature the W&T 7-point check-up as a guide to permanent protective measures and will show adaptations of standard chlorinators for emergency use as well as featuring several items of portable and mobile emergency chlorinating apparatus.

WESTINGHOUSE ELEC. & MFG. COMPANY

BLOOMFIELD, N. J. Nos. 101 AND 103

Featuring "STERILAMP Conditioning"—the application of STERILAMPS for the effective control of airborne and surface bacterial contamination. The generation, measurement and use of selected bands of ultraviolet radiation best suited for bactericidal applications in the field of Public Health will be described, illustrated and demonstrated. Sanitization equipment, STERILAMP fixtures

and ultraviolet measuring devices will be on display. Westinghouse invites members and visitors to Booths No. 101-103.

**WESTINGHOUSE X-RAY COMPANY,
INC.**

LONG ISLAND CITY, N. Y. Nos. 412
AND 414.

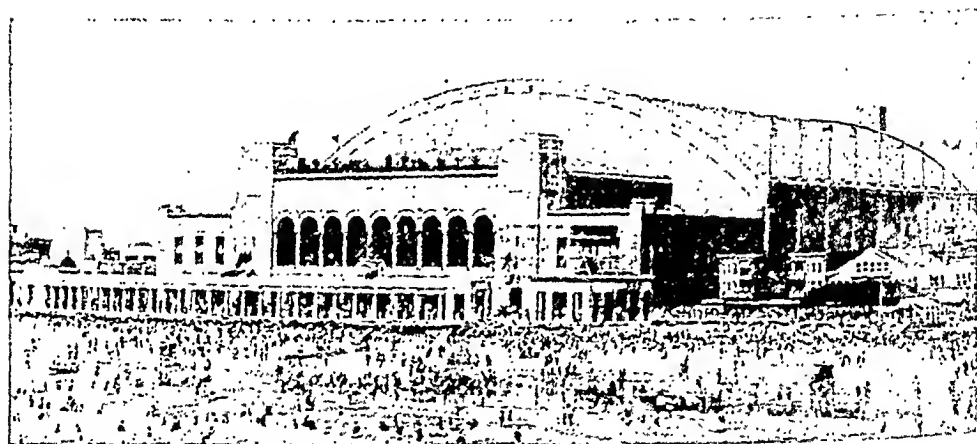
Westinghouse X-ray Booths 412 and 414 will have an interesting display of 35 mm chest films and photofluorographic equipment. The photofluorographic equipment is designed for economical and rapid differential chest radiography at low cost, in order to separate normal from suspicious cases, the latter recommended to be radiographed in the conventional manner on full size film.

WHITE LABORATORIES, INC.

NEWARK, N. J. No. 204

White Laboratories, Inc., will present in Booth No. 204 White's Cod Liver Oil Concentrate Liquid, Tablet and Capsule and White's Thiamin Chloride Tablet—all Council-Accepted.

Well-trained, courteous representatives will be in attendance to discuss the practical advantages provided by Cod Liver Oil Concentrate as an economical and convenient measure of Vitamin A and D prophylaxis and therapy. Pertinent information concerning our newer knowledge of the vitamins and vitamin deficiency states, together with literature descriptive of the clinical merit of the products of White Laboratories, will be offered for the registrant's consideration.



Convention Hall, Atlantic City, N. J.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

POSITIONS AVAILABLE

Public Health Engineer with the Department of Health of a city of 100,000 population in the Midwest. Give age, training, experience and references. Write Box M, A.P.H.A. Employment Service.

Southern State Department of Health seeks physicians qualified by training and experience as County Health Officers or as Pediatricians. Write Box B, A.P.H.A. Employment Service.

Western State Department of Health will consider applications from physicians with experience and a degree in public health. Write Box S, A.P.H.A. Employment Service.

Sanitary Chemist for sewage laboratory

in Eastern city. Salary \$2,000. Graduate preferred. Write Box V, A.P.H.A. Employment Service

Physician with public health training to serve as full-time county health officer in rural South Atlantic area. Salary \$3,600 to \$4,000. Write Box C, A.P.H.A. Employment Service.

County Public Health Nurses for New Mexico. Must have 4 months' post-graduate instruction under one of the recognized public health nursing courses and 1 year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, New Mexico.

U. S. CIVIL SERVICE COMMISSION

The Commission has announced that applications will be received for positions as Senior Medical Officer (\$4,600), Medical Officer (\$3,800), and Associate Medical Officer (\$3,200) for appointments in the Public Health Service, with the Food and Drug Administration, Veteran's Administration and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington.

The Commission also announces that applications may be filed for the positions of Public Health Nurse (\$2,000) and Graduate Nurse, general staff duty (\$1,800) in the Indian Field Service, including Alaska.

A civil service examination for Public Health Nurse (\$2,000 a year) has been open for some time. Nurses who have been unable to qualify for this examination because of the experience requirement now have an opportunity to qualify through a new Junior Public Health Nurse examination (\$1,800 a year) which requires no experience. Applications are also being received for examinations now open for Junior Graduate Nurse (\$1,620 a year) and Graduate Nurse for general staff duty (\$1,800 a year). Forms may be obtained from the Civil Service Commission, Washington, D. C.

UNASSEMBLED EXAMINATIONS IN WEST VIRGINIA

The Merit System Council of West Virginia, Box 873, Morgantown, has announced that it is expected that unassembled examinations will shortly be given for the following positions in the West Virginia State Health Department.

Position	Salary per month
Chief of Medical Services	\$325-\$400
Ophthalmologist	275- 350
Director of County Health Work	350- 400
Director, Maternal & Child Hygiene	350- 400
Director, Communicable Diseases	350- 400
Director, Vital Statistics	350- 400
Director, Industrial Hygiene	350- 400
Assistant Director, Maternal & Child Hygiene	320- 375
Assistant Director, Communicable Diseases (Venereal)	320- 375
Assistant Director, Tuberculosis	320- 375
Venereal Disease Consultant	320- 375
Senior Health Officer	320- 375
Junior Health Officer	280- 320
Health Officer Trainee	\$200

Residence in West Virginia has been waived in consideration of the applications for these positions. However, residents of the state may be given preference in making appointments. Complete information may be obtained by writing to the Merit System Council.

POSITIONS WANTED

The Employment Service is in touch with specialists in several branches who wish teaching positions.

ADMINISTRATIVE

Physician with C.P.H. and special training in Venereal Disease Control wishes position in medical administration or in V.D. control work. Experienced as county health officer. A485

Physician with M.P.H. from Hopkins, experienced as county and district health officer, seeks responsible administrative position. A458

Physician with Dr.P.H. from Hopkins, special interests in mental hygiene and epidemiology, well experienced in teaching, will consider administrative, teaching, or investigating work. A486

Physician with M.P.H. from Hopkins 1924, experienced as state director for communicable diseases, as county health officer and as director of field training center, will consider responsible position with good income. A483

Physician, aged 44, graduate of Rush Medical, completing work at Johns Hopkins for M.P.H. and experienced as director of rural unit, will consider opening. A480

Physician, graduate of University of Iowa, candidate for Dr.P.H. at Harvard, seeks good administrative position. A476

Physician, aged 40, M.D. University of Minnesota, C.P.H. and Dr.P.H. Johns Hopkins, experienced in epidemiology and venereal disease control, will consider interesting position. A482

Physician, specialist in maternal and child health. M.D. University of Kansas, M.P.H. Harvard. Excellent background in pediatric residencies, experienced in municipal and county health work and as director of a state program, as pediatrician, or in school or college health program. A479

Dentist, University of Pittsburgh, D.D.S., M.P.H. University of Pennsylvania 1941, experienced in practice, wishes an administrative position in public health, preferably at state level. M450

HEALTH EDUCATION

Young woman with Master's degree in Health Education, Teacher's College, Columbia University, and background of clinical laboratory work and biochemistry, seeks position as health educator in research or as laboratory assistant in public health. H494

Health educator, man 32, M.S.P.H., with excellent training and varied experience in education and public health.

Would expect salary of \$3,000. Prefers National or State organization. Excellent references. H405

LABORATORY

Laboratory Director. Unusually well qualified and experienced man, aged 41, Ph.D. with training at Michigan, M.I.T. and Maryland, excellent references. Will consider administrative, teaching or research position in public health. L459

Experienced woman bacteriologist, now employed, graduate Iowa State College 1925, 6 months on Fellowship at Johns Hopkins 1930, wishes position in serology, bacteriology or research. L458

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology and serology, will consider opening. L427

Experienced laboratory technician. Woman with 17 years in large midwest municipal laboratory. Has 12 year background in the Kahn test. Excellent references. Immediately available. Will consider any location. L459

SANITARY ENGINEERING

Engineer, aged 38, 3 years' experience as district sanitary supervisor, state department of health, together with work on plumbing, heating and ventilation, will consider position in the plumbing or heating field, or state department of health. Prefers middle western or western states. E453

Public Health Engineer, M.S. Harvard, experienced in public health and industrial hygiene, wishes position of better sort in public health engineering or industrial hygiene. E470

Public Health Engineer, M.S. Harvard, with more than 10 years' experience including 5 years with state division of sanitation, is available. A468

STATISTICAL

Public Health Statistician. Young man M.S.P.H. Michigan, now employed as supervisor of state health project, experienced in medical economic research, epidemiology studies and vital statistics, seeks position in city or state health department in midwest. S458

Advertisement

Opportunities Available

PUBLIC HEALTH PHYSICIANS—(a) Young physician with background in public health and some experience industrial medicine for interesting executive appointment with national organization; considerable traveling; \$4,200-\$4,500. (b) Physician for maternal and child health work in municipal health department; midwest; \$4,300. (c) Pediatrician for appointment with state department of health; responsibility will include 13 counties in southern state; woman physician eligible. (d) Physician to conduct generalized public health program; \$3,500-\$4,000; East. (e) Physician for interesting appointment with municipal department of health in tropics; facilities for research available. (f) County health physicians; several needed by state department of health in South; southerners under 40 preferred; women eligible. (g) Several young physicians trained in public health for rural health service; Southwest. (h) For staff appointment; city health department; Ohio. (i) Young physician with California license able to conduct well baby conferences, do fluoroscopy in tuberculosis survey clinics, some communicable disease work; may consider woman physician; \$3,300, plus mileage. (j) Assistant city health officer interested also in assuming duties of school physician; special training in public health not required; \$275, rapid advancement; city of 80,000; South. (k) School physician; large industrial center; man with public health degree or training preferred; Midwest. PH8-1, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—(a) Physician qualified to organize and head department of student health in large eastern college for men; Protestant preferred, since school is denominational. (b) For appointment on student health staff; state university; opportunity to engage in clinical research; central state. PH8-2, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—(a) Educational director for large community health organization; college and public health nursing degrees required; about \$175. (b) City-county nurse; \$135, mileage allowance; West. (c) Three school nurses, fully qualified in public health; vacancies are in elementary and junior high schools of large midwestern industrial city; excellent salary; security; desirable working conditions. (d) Out-patient nurse; ability to reorganize department essential; fully approved children's hospital. PH8-3, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

BACTERIOLOGISTS—(a) Senior and junior bacteriologists for municipal health department; degree, experience in public health laboratory procedures important; \$1,200-\$2,000. (b) Assistant bacteriologist; department of health; Chicago area; \$125. PH8-4, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

Situations Wanted

PUBLIC HEALTH PHYSICIAN—B.S., M.D. degrees, state university; M.S.P.H., University of Michigan; several years' successful general practice, including part-time health appointment; 4 years' administrative experience with state department of health; for further information write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—B.S. degree in Public Health Nursing, Columbia; graduate of one of country's outstanding hospitals; experience includes several years as infant welfare nurse, 6 years as educational supervisor in out-patient department of large teaching hospital; past several years, instructor of public health nursing, large teaching hospital; for further information write

Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Fairly recent graduate of midwestern training school; certified public health nurse; will receive special teacher's certificate upon completion courses in university medical school; for further information, write Burneice Larson, Director, Palmolive Building, Chicago.

BACTERIOLOGIST—A.B., Ph.D., state university; 6 years, university laboratory of animal pathology; 4 years, parasitologist, state department of public health; for further information, write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

NATIONAL CONFERENCE ON NUTRITION

A NATIONAL Nutrition Conference called by Honorable Paul V. McNutt, Administrator of the Federal Security Agency, at the direction of President Roosevelt was held late in May in Washington. More than 500 especially invited persons participated, representing many related specialties and the public.

At the conclusion of the 3 day session, the National Nutrition Program for America was adopted in order to

raise the nutritional standards of the American people to the highest possible levels. It was expected that the administration of the program would be placed in the hands of a body of experts representing science, industry, and government, to be created by executive order and incorporated in the office of the Coördinator of Health, Welfare and Related Defense Activities of the Federal Security Agency. The conference report, entitled "Recommendations of

CHART OF RECOMMENDED DAILY ALLOWANCES FOR SPECIFIC NUTRIENTS¹
Committee on Foods and Nutrition, National Research Council

	Calories	Protein	Calcium	Iron	A ²	Thiamin (B ¹) ²	Ascorbic Acid (C) ²	Ribo- flavin	Nico- tinic Acid	D
		gm.	gm.	mg.	I.U.	mg.	mg.	mg.	mg.	I.U.
Man (70 kg.)										
Moderately active	3,000	70	0.8	12	5,000	1.8	75	2.7	18	"
Very active	4,500					2.3		3.3	23	
Sedentary	2,500					1.5		2.2	15	
Woman (56 kg.)										
Moderately active	2,500	60	0.8	12	5,000	1.5	70	2.2	15	"
Very active	3,000					1.8		2.7	18	
Sedentary	2,100					1.2		1.8	12	
Pregnancy (latter half)....	2,500	85	1.5	15	6,000	1.8	100	2.5	18	400-800
Lactation	3,000	100	2.0		8,000	2.3	150	3.0	23	400-800
Children up to 12 years										
Under 1 year ⁴	100 per kg.	3-4 per kg.	1.0	6	1,500	0.4	30	0.6	4	400-800
1-3 years	1,200	40	1.0	7	2,000	0.6	35	0.9	6	
4-6 years ⁴	1,600	50	1.0	8	2,500	0.8	50	1.2	8	
7-9 years	2,000	60	1.0	10	3,500	1.0	60	1.5	10	"
10-12 years	2,500	70	1.2	12	4,500	1.2	75	1.8	12	
Children over 12 years										
Girls—13-15 years	2,800	80	1.3	15	5,000	1.4	80	2.0	14	"
16-20 years	2,400	75	1.0	15	5,000	1.2	80	1.8	12	
Boys—13-15 years	3,200	85	1.4	15	5,000	1.6	90	2.4	16	
16-20 years	3,800	100	1.4	15	6,000	2.0	100	3.0	20	"

¹ These are tentative allowances toward which to aim in planning practical dietaries. These allowances can be met by a good diet of natural foods; this will also provide other minerals and vitamins, the requirements for which are less well known.

² 1 mg. thiamin equals 333 International Units; 1 mg. ascorbic acid equals 20 International Units (1 International Unit equals 1 U.S.P. unit).

³ Requirements may be less than these amounts if provided as vitamin A, greater if chiefly as the provitamin carotene.

⁴ Needs of infants increase from month to month. The amounts given are for approximately 6-18 months. The amounts of protein and calcium needed are less if from breast milk.

⁵ Vitamin D is undoubtedly necessary for older children and adults. When not available from sunshine, it should be provided probably up to the minimal amounts recommended for infants.

⁶ Allowances are based on the middle age for each group (as 2-5, 8 etc.), and for moderate activity.

the National Nutrition Conference for Defense to the President of the United States" asserted that it was as vital for the United States to make immediate use of its knowledge of nutrition in the present national emergency as to take indicated steps of military preparedness.

The report of the conference urged the use of the recommended allowances of calories, protein, and certain important minerals and vitamins as prepared by the Committee on Food and Nutrition of the National Research Council (see attached table).

The report encouraged more widespread education of doctors, dentists, social service workers, teachers, and other professional workers in the newer knowledge of nutrition and a mobilization of every educational method to spread the newer knowledge among laymen by means of schools, motion pictures, the radio, the public press, home and community demonstrations.

There should be mobilization of all neighborhood, community, state and national organizations and services. There should be vigorous and continued attack upon the fundamental problems of unemployment, insecure employment, and the attainment of rates of pay adequate to maintain an American standard of living. There should be encouragement in all practical ways of greater production by agriculture of the foods needed in more abundance. The report urged the enrichment of certain staple food products such as flour and bread with nutritive elements that have been removed by modern milling and refining processes.

"No nation, certainly no great nation, has every truly conquered hunger, the oldest enemy of man. Such an aim is not too high, such a goal is not too difficult for the people of the United States. It is in line with our tradition of pioneering on new frontiers. It is a particularly fitting task for us at this day when Democracy should point the

way to a new and better civilization for oppressed peoples all over the earth."

PUBLIC HEALTH RESEARCH INSTITUTE OF NEW YORK CITY, INCORPORATED

DR. John L. Rice, Commissioner of Health of New York City, announced on June 29 that an appropriation of \$100,000 had been included in the 1941-1942 budget of the Health Department to be used for scientific research essential to the protection and the improvement of health, safety, and welfare of the people of New York City. Authority had been granted for the city to enter into a contract with the Public Health Research Institute, Inc., which is a scientific, non-profit organization, devoted "to obtaining for the city the best available biological products and advanced skills and procedures for combating disease and epidemics which occur or may occur."

The Board of Directors of the Research Council includes David M. Heyman, a member of the New York City Board of Health, President; David Rockefeller, Vice-President; David Morse, Secretary; and Edwin P. Chinlund, Treasurer. Ex-officio members of the Board include the Mayor of New York City, the Comptroller and the Health Commissioner.

A Research Council has been set up headed by Thomas M. Rivers, M.D., Director of the Hospital of the Rockefeller Institute for Medical Research, as Chairman. Other members include Eugene L. Opie, M.D., Henry C. Sherman, Ph.D., Michael Heidelberger, Ph.D., George Baehr, M.D., and Ralph S. Muckenfuss, M.D. Neither members of the Board of Directors nor of the Research Council will receive salary, the province of the former being to assure sound business management and of the latter to retain the necessary scientific personnel. The Institute will be housed in the Health Department's Bureau of Laboratories located in the William

Hallock Park Laboratory at the foot of East 15th Street, Manhattan.

Dr. Rice pointed out that, while a limited amount of research work has been carried forward in the Health Department's Bureau of Laboratories, through a corporate structure known as Health Research Fund, Inc., the staff has been inadequate and funds which for the most part had come from voluntary sources, were insufficient to carry forward scientific research necessary for a city of 7,500,000. The Research Institute has absorbed the corporate structure of Health Research Fund, Inc., and, by terms of the contractual agreement with the city, it may continue to receive and accept grants, gifts, bequests and contributions from private or foundation sources with the consent of the Commissioner of Health. All scientific results which accrue from the Research Institute will become the property of the City of New York.

REPRINTS AVAILABLE

THE following reprint is available to JOURNAL readers without charge on request of the author:

"Some Notes Concerning Human Intestinal Parasites and Social Welfare in the United States," by William Hugh Headlee, M.S., Ph.D. Parasitology Laboratory, Department of Biology, Purdue University, Lafayette, Ind.

HEALTH HAZARD ELIMINATED IN HAT INDUSTRY

ON May 19 the nation's hat industry agreed to eliminate poisonous mercurial compounds from the manufacture of fur felt after December 1, 1941. The agreement, which was reached during conference with Surgeon General Thomas Parran of the Public Health Service, is expected to remove one of the oldest and most dangerous health hazards to workers.

Participating in the agreement were representatives of the industry—The Hatters' Fur Cutters Association and

the Hat Institute, Inc., of New York. Workers were represented by officials of the United Hatters, Cap and Millinery Workers International Union. Health and labor commissioners of New York, Pennsylvania, New Jersey, Massachusetts and Connecticut, states in which the nation's felt hat industry is concentrated, also took part in the Conference.

Adoption of the regulations is expected to afford protection for the 22,000 workers employed in the American fur felt and hat industry.

PHILIPPINE ISLANDS

THE Philippine legislature has approved the creation of a Department of Health and Public Welfare to take the place of the former administration as a division of the Department of Public Instruction. Dr. Jose Fabella, Manila, who has been Commissioner of Health and Welfare under the former arrangement, has been appointed Secretary of Health, and Dr. Hilario Lara, Manila, is Undersecretary.

POSTGRADUATE COURSES IN ADVANCED CLINICAL NURSING AT WESTERN RESERVE

THE School of Nursing of Western Reserve University, Cleveland, Ohio, in affiliation with the City Hospital of Cleveland and the Anti-Tuberculosis League of Cleveland, offers in September a program for graduate nurses in tuberculosis, including lectures, clinics, demonstrations and conferences related to the disease and the broad aspects of tuberculosis as a major community health problem.

The School of Nursing also offers an advanced clinical program in obstetric nursing of one semester's duration and a 6 months' graduate program in orthopedic nursing, primarily for public health nurses and supervisors of orthopedic nursing services. Information may be obtained from the School of Nursing at 2063 Adelbert Road, Cleveland.

DR. BAEHR APPOINTED MEDICAL
DIRECTOR, OFFICE OF CIVILIAN
DEFENSE

DR. GEORGE BAEHR of New York has been appointed Chief Medical Director of the Office of Civilian Defense and of the Public Health Service, according to an announcement by Mayor Fiorello H. LaGuardia, Director of the Office of Civilian Defense. Dr. Baehr will coordinate the activities of that office and the Public Health Service. He will have headquarters in the Public Health Service Building and will be assisted by an advisory medical board.

The Office for Civilian Defense is concerned with the development of plans and facilities for disaster relief in the cities, beginning with the cities along both seacoasts.

NATIONAL ORGANIZATION FOR PUBLIC
HEALTH NURSING

THE N.O.P.H.N. is pleased to announce that the National Foundation for Infantile Paralysis has renewed the grant to the N.O.P.H.N. to provide for seven scholarships to assist nurses to prepare themselves for orthopedic nursing.

Further details and application blanks may be obtained by writing to Jessie L. Stevenson, Secretary, Committee on Orthopedic Scholarships, National Organization for Public Health Nursing, 1790 Broadway, New York, N. Y.

AMENDMENT TO SOCIAL SECURITY ACT

THE Washington News Letter on Social Legislation reports that considerable support is developing in Washington for an amendment to the Social Security Act which would authorize reimbursement to states for expenditures for medical care. The plan would permit direct payment by states to doctors and hospitals. An amendment was drafted two years ago to accomplish

this purpose but, after some study by federal officials, this plan was dropped lest it jeopardize more comprehensive health plans which were then pending. With the growing recognition that medical care is an essential feature of adequate public assistance, there is increasing interest in this proposal.

DR. JAMES FREDERICK ROGERS RETIRES

THE retirement of Dr. James Frederick Rogers, Consultant in Hygiene of the U. S. Office of Education, was announced effective May 31. Entering the government service first in 1920 in the office of Industrial Hygiene, U. S. Public Health Service, Dr. Rogers in 1923 joined the staff of the Office of Education. He received his M.D. at Yale in 1905, his C.P.H. in 1919, and Dr.P.H. in 1920.

An authority in the field of school health, Dr. Rogers has been the author of many government publications dealing with the health, physical education, safety, and welfare of Americal school children and teachers. One of the best sellers of his many Office of Education bulletins has been "What Every Teacher Should Know About the Physical Condition of Her Pupils" of which more than 125,000 copies are said to have been sold.

A reception for Dr. Rogers attended by his coworkers was held on May 28 in the library of the Office of Education.

CIVILIAN DEFENSE MEDICAL BOARD

MAYOR Fiorello H. LaGuardia of New York City, head of the Office of Civilian Defense, has named a four man civilian defense medical board to include the planning of emergency field stations in which injured persons would receive emergency treatment before being evacuated to base hospitals. Members of the Board include Albert McCown, M.D., of Washington, Assistant Medical Director of the American Red

Cross; Elliot C. Cutler, M.D., Professor of Surgery at Harvard University, Boston; George Baehr, M.D., New York, N. Y.; and Oliver Kiel, M.P., President of the Texas State Board of Medical Examiners.

ARMY VACANCIES FOR DIETITIANS

APPROXIMATELY 350 vacancies for dietitians now exist in army hospitals, which now have 103 dietitians on duty, according to the *J.A.M.A.* A school for dietitians is conducted at the Army Medical Center in Washington, D. C. The requirements for entrance include graduation from a recognized college with a major course in dietetics and nutrition. The pay of dietitians is \$1,800 a year. In time of peace only women certified by the Civil Service Commission are eligible. In time of war, however, men qualified as dietitians will be enlisted as technical sergeants as far as vacancies exist.

SOCIEDAD MEXICANA DE PEDIATRÍA

THE following are the new officers of the Sociedad Mexicana de Pediatría, Mexico, D. F. Mexico.

President—Dr. Fernando Lopez Clares

Vice-President—Dr. Demófilo González

Treasurer—Dr. Ernesto González Tejeda

Secretary—Dr. J. G. Pagola

COURSE IN INDUSTRIAL HEALTH

THE University of Chicago, through the Department of Nursing Education, is offering a course in industrial health to public health nurses for the autumn and winter quarters, 1941-1942. It will include a study of the origin and development of industrial health programs and present-day objectives, organization, and activities. Special emphasis will be given to the rôle of the nurse.

Experts in the field of industrial health will participate in the course.

NATIONAL RECREATION CONGRESS

AMONG the topics for discussion at the twenty-sixth National Recreation Congress, in Baltimore, Md., from September 29 to October 3 on the subject, "The America We Defend," will be: Long-Range Planning for Recreation—The Baltimore Example; Recreation in Rural Communities; Modern Industry and the Recreation Needs of the Employees; Recreation for Girls and Women; Planning, and Use of School Buildings for Community Recreation; The Rôle of the Church in Recreation; Methods of Increasing Recreation Opportunities for Colored Groups; Joint Planning of Public and Private Agencies in Meeting Recreation Needs.

PERSONALS

Central States

ROBERT M. FERGUSON, M.D., Indianapolis, Ind., has been named Director of Health District No. 4, with headquarters in Rising Sun. He succeeds **DR. GEORGE M. BROTHER,†** who is now Chief of the Bureau of Local Health Administration, Indianapolis. District No. 4 includes the Counties of Dearborn, Ripley, Jefferson, Switzerland, and Ohio.

GLENN V. HOUGH, M.D., formerly of Milwaukee, Wis., has been appointed Health Officer of the fourth Public Health District with headquarters at Sparta.

EDWIN H. JORRIS, M.D.,† has been appointed Director of Local Health Services for the Wisconsin State Board of Health.

WALLACE S. PETTY, M.D.,* Sioux City, Iowa, has resigned as Health Officer of Woodbury County. He has been succeeded by **DR. JOHN A. COWAN**,

* Fellow A.P.H.A.

† Member A.P.H.A.

who has been Acting Director of Public Health for Sioux City and Woodbury County.

CECIL A. Z. SHARP, M.D.,† has resigned as superintendent of the Macomb Health District to enter private practice in Trenton, Ill.

CHESTER A. SPITLER, M.D., Middletown, Ohio, has been named Health Commissioner of the town to succeed the late DR. GEORGE D. LUMMIS.

ARTHUR R. ZINTEK, M.D., of Durand, Wis., has been appointed Health Officer of the first District with headquarters in Madison, to succeed the late DR. GUY W. HENIKA.

Eastern States

ROBERT R. BALMER, JR.,† Senior Sanitary Engineering Aide with the Massachusetts Department of Public Health at Westfield, Mass., has resigned to accept a position in the U. S. Public Health Service in Washington.

FRANCIS B. CARROLL, M.D.,† State District Health Officer, Massachusetts Department of Public Health, has been called for military service. He has been detailed to Camp Devens, Mass.

MILLARD C. HANSON, M.D.,* of Pittsburgh, Pa., was appointed Commissioner of Health of Richmond, Va., as announced on June 14 by JESSE M. JOHNSON, Director of the Department of Public Welfare. Dr. Hanson, who is now the Director of the Pittsburgh Syphilis Control Program, was formerly Health Officer of Toledo. He will take up his duties on August 1.

ARTHUR P. LONG, M.D.,† Assistant Director of the Division of Biologic Laboratories, Massachusetts Department of Public Health, has been called for military service, and has been assigned to the office of the Surgeon General in Washington.

ALBERT McCOWN, M.D., of New York City, recently on the staff of the New York City Department of Health, has become associated with the National Headquarters of the American Red Cross on June 1, as Assistant Medical Director.

WILLYS N. MONROE, M.D.,† Health Commissioner of Pittsfield, Mass., has been called into active service at Camp Edwards, Mass. His place will be taken temporarily by DR. HARRY B. FRANCHERE,† of Altamont, N. Y., recently with the Summit County, Ohio, Health Department.

FRED L. MOORE, M.D., C.P.H.,* of Brooklyn, N. Y., has been appointed Professor and Executive Officer of the Department of Preventive Medicine and Community Health, at Long Island College of Medicine, Brooklyn, N. Y. Dr. Moore succeeds DR. A. E. SHIPLEY,* who retired on July 1.

HENRY FIELD SMYTH, M.D.,* Assistant Professor of Industrial Hygiene, University of Pennsylvania School of Medicine, is retiring at the end of the present academic year.

ALEX J. STEIGMAN, M.D., of the Harvard Medical School staff, has left for England to take up his work as pediatrician with the American Red Cross—Harvard University Hospital for Infectious Diseases.

The University of Pennsylvania conferred the degree of Doctor of Science at its recent Commencement on DR. JOHN J. SHAW,† recent Secretary of Health for Pennsylvania, and on DR. RICHARD WILSON of Havana, Cuba, in recognition of public health work.

CHARLES F. WILINSKY, M.D.,* Director of Beth Israel Hospital and Deputy Commissioner of Health, Boston City Department of Health, of Boston, was awarded the honorary degree of Master of Arts by Harvard

* Fellow A.P.H.A.

† Member A.P.H.A.

University at the 305th Commencement on June 19.

ALEXANDER WITKOW, M.D., M.P.H.,† of New York, on the completion of his course in Public Health at Yale University, has been appointed Director of the Dickinson County Health Department in Iron Mountain, Mich.

Southern States

LEE A. DARE, M.D., formerly of Lawrenceburg, Ky., has resigned as Health Officer of Anderson County.

LEROY L. FATHERREE, M.D.,† has been chosen Health Officer of Little Rock, Ark.

L. L. FRIEDMAN has been appointed Sanitary Supervisor and Rodent Control Director of Richmond, Va.

JUSTINA H. HILL, M.D., Bacteriologist at Johns Hopkins University, was granted the Doctor of Science degree on June 16 by Smith College, Northampton, Mass.

WILL H. LASSITER, JR., M.D., of Selma, N. C., has been appointed Health Officer of Johnston County to succeed Dr. JAMES H. BUNN, JR., Smithfield, who resigned to enter military service.

PAUL R. MACFAYDEN, JR., M.D.,† Concord, N. C., recently Acting Health Officer of Cabarrus County, has been appointed in Richmond County to succeed Dr. TIDAL BOYCE HENRY, Rockingham.

E. G. MCGAVRAN, M.D., M.P.H.,† Director of the Monongalia County Health Department, Morgantown, W. Va., and Director of the West Virginia Public Health Training Center, has resigned effective August 1, to accept the position of Health Officer of St. Louis County, Mo., where he succeeds Dr. T. R. MEYER, who has entered military service.

PAUL D. MOORE, M.D.,† of Calhoun, Ky., has resigned as Health Officer of McLean County.

FRAY OWEN PEARSON, M.D., C.P.H., formerly Director of the Hamilton County Health Department in Tennessee, was appointed Director of a new health unit which is a consolidation of the Hamilton County-Chattanooga Health Department, effective July 1. DR. W. C. WILLIAMS,* Commissioner of Public Health of Tennessee, has announced that this is the first city-county unit in the state.

EMIL A. STEINER, M.D.,† Somerset, Ky., has resigned as Health Officer of Pulaski County.

STARLING D. STEINER, M.D.,† of Wellsburg, W. Va., Health Officer of Brooke County, has been appointed Director of county health work in the State Health Department, to succeed Dr. BRUCE H. POLLOCK,* Charleston, who recently reported for duty with the U. S. Navy.

HARRY F. WILSON, M.D.,* Director, Medical Hygiene Division of the State Board of Health, Columbia, S. C., Major, Army Medical Reserve Corps, has been ordered to extended active duty for a period of a year. Major Wilson will be assigned to Fort Meade, Md.

R. MANTON WILSON, M.D., has been appointed Medical Inspector and City Epidemiologist of Richmond, Va.

Western States

FRANK G. CRANDALL, M.D.,* has been appointed Epidemiologist of the City Health Department, Los Angeles, Calif. He succeeds Dr. CARL J. HAWLEY, who has been called to active duty in the Army.

HUGH DIERKER, M.D., M.P.H.,† has been appointed District Health Officer of the Compton District in Los Angeles County, Calif., following a Civil Service examination. The territory includes Compton, Lynwood,

* Fellow A.P.H.A.

† Member A.P.H.A.

Downey, Bellflower, Signal Hill, Catalina Island and surrounding territory, with a population of about 100,000.

J. C. GEIGER, M.D.,* Health Officer of the City and County of San Francisco, Calif., was awarded the decoration of the White Cravat with Red and Blue Borders of the Illustrious Order of the Jade, by Generalissimo Chiang Kai-shek of China, "For work of merit in public health in the Republic of China and among the Chinese population in San Francisco."

CARL E. GREEN,* State Sanitary Engineer, Oregon State Board of Health, has resigned to enter consulting engineering practice. He is to be succeeded by CURTISS M. EVERTS, JR.

GEORGE F. MANNING, M.D.,† of Flagstaff, Ariz., has been appointed State Superintendent of Public Health in Arizona by a recently created Board of Public Health.

DEATHS

B. BARRETT, M.D., of Boston, Assistant Director of the Division of Communicable Diseases, Massachusetts

Department of Public Health, died May 31.

GEORGE O. ADAMS,† Chief Chemist at the Lawrence Experiment Station of the Massachusetts Department of Public Health since 1934, died June 22.

BRUCE MAYNE, Dr.P.H., identified with the U. S. Public Health Service in various capacities since 1908, died in the U. S. Marine Hospital, Baltimore, April 30, following an extended illness.

JOHN J. SHAW, M.D.,† State Secretary of Health for Pennsylvania, died suddenly in Harrisburg on June 24 of a heart attack, at the age of 53 years. Appointed to his post in January, 1939, Dr. Shaw's influence on public health was recognized in 1940, when he received from the Philadelphia County Medical Society its Strittmatter Medal, and with the receipt of honorary degrees from the University of Pennsylvania and from Temple University, Philadelphia, in 1941.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

American Association of Public Health Dentists. Annual Meeting. Lamar Hotel, Houston, Tex. October 26-28.

American College of Surgeons. Hotel Statler, Boston, Mass. November 3-7.

American Congress of Physical Therapy—20th Annual Scientific and Clinical Session. The Mayflower Hotel, Washington, D. C. September 1-5.

American Dietetic Association—24th Annual Convention. Hotel Jefferson, St. Louis, Mo. October 20-23.

American Hospital Association. Atlantic City, N. J. September 15-19.

American Library Association—Midwinter Conference. Chicago, Ill. December 28-31.

American Public Health Association—70th Annual Meeting. Convention Hall, Atlantic City, N. J. October 14-17.

American Water Works Association—Western Pennsylvania Section—Lawrence Hotel, Erie, Pa. August 7-9.

New York Section—Hotel Queensbury, Glens Falls, N. Y. September 11-12.

Rocky Mountain Section—Lafonda Hotel, Santa Fe, N. M. September 18-19.

Michigan Section—Hotel Pantlind, Grand Rapids, Mich. September 24-26.

Minnesota Section—Nicollet Hotel, Minneapolis, Minn. October 9-11.

Southwest Section—Fort Worth, Tex. October 13-16.

New Jersey Section—Atlantic City, N. J. October 16-18.

Missouri Valley Section—Montrose Hotel, Cedar Rapids, Iowa. October 20-22.

California Section—Fresno Hotel, Fresno, Calif. October 22-25.

Kentucky-Tennessee Section—Hotel Andrew Jackson, Nashville, Tenn. October 27-29.

North Carolina Section—Sheraton Hotel, High Point, N. C. November 3-5.

Four States Section—Baltimore, Md. November 6-7.

Child Study Association of America. Hotel Commodore, New York, N. Y. November 14-15.

Dairy Industries Exposition. Concurrent with annual convention of the International Association of Milk Dealers, and the International Association of Ice Cream Manufacturers. Automotive Building, Canadian National Exhibition. October 20-25.

Federation of Sewage Works Association. New York, N. Y. October 9-11.

Florida Public Health Association. Orlando, Fla. December, 1941.

Idaho Public Health Association. Lewiston, Ida. October 6-7.

International Association of Milk Sanitarians, Inc.—Annual Meeting. Mayo Hotel, Tulsa, Okla. October 27-29.

Michigan Public Health Association. Grand Rapids, Mich. November 12-14.

National Safety Council. Chicago, Ill. October 6-10.

National Society for the Prevention of Blindness. New York, N. Y. December 4-6.

New Mexico Public Health Association. Gallup, N. M. October 30-November 1.

New York State Association of Dairy and Milk Inspectors. Annual Meeting. Hotel Statler, Buffalo, N. Y. September 24-26.

Pennsylvania Sewage Works Association. State College, Pa. September 3-5.

Foreign

International College of Surgeons. Mexico City, Mexico. August 10-13.

Pan American Medical Association—8th Congress. Buenos Aires, Argentina. 1941.

Second Inter-American Congress of Municipalities. Santiago, Chile. September 15-21.

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Administration of Medical Services as Part of a Health Department Program*

DANIEL L. SECKINGER, M.D., DR.P.H.

*Assistant Health Officer, Coördinator, Health and Hospitals, District of
Columbia Health Department, Washington, D. C.*

AT present a vast amount of difference exists among health departments with respect to responsibility for the care of the indigent sick. Even in the smallest county health unit it is often necessary for the health officer with a county nurse to administer medical care to the indigent sick. In larger health organizations the amount of medical care varies with almost every organization, from clinic treatment of tuberculosis and venereal disease cases to the supervision of treatment for pneumonia, cancer, malaria, hookworm disease, direction of the physicians to the poor, management of communicable disease hospitals, to full responsibility for all phases of a medical care program of the indigent sick.

Surveys of medical and health facilities for states and municipalities in the United States have shown that no comprehensive and detailed account of com-

munity organization and management of public medical services is readily available. Michael M. Davis points out that "There are endless variations in the degree to which public medical services are performed by different governmental units, even within the same state."¹ It would be helpful in prescribing standards of medical care if a complete picture could be obtained of public health procedure and medical care services in relation to kinds of organization, costs, social status, and the professional and administrative relationships. This paper is primarily concerned with an account of correlation, coördination, and integration of service within the health department itself, having as its ultimate goal continuity of service. In many communities this is not possible because of the many units of governmental or private agencies which have more or less responsibility in the purely medical and sociological aspects of medical care.

The responsibility of the District of Columbia Health Department for the care of indigent sick began in 1937

* Read before the Health Officers Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

when the Congress transferred all facilities for the care of the sick from the Board of Public Welfare to the Health Department. The enabling act to make the transfer possible reads succinctly and briefly as follows:

For the following hospitals and sanatoria, which, on and after July 1, 1937, shall be under the direction and control of the Health Department of the District of Columbia and subject to the supervision of the Board of Commissioners.

The Health Officer became Director of the Department of Health and Hospitals, and the Assistant Health Officer the Coördinator of the Health and Hospital Services.

The institutions and services transferred to the department include Gallinger General Hospital, Glenn Dale Tuberculosis Sanatorium, the Hospital Permit Bureau, the Ambulance Service, Physicians-to-the-Poor, and the administration of contracts for medical care with the Children's Hospital, Emergency Hospital, Casualty Hospital, and the Washington Home for Incurables.

The Gallinger General Hospital is an institution of 1,105 beds, with departments of surgery, medicine, obstetrics and gynecology, pediatrics, contagious diseases, psychiatry, tuberculosis, laboratory, x-ray, and other specialties appropriately placed under the main departments mentioned above. There are also some of the usual outpatient clinics of a large hospital.

The Glenn Dale Sanatorium is an institution of 760 beds with ample facilities for the complete care of tuberculosis cases, including medicine, surgery, x-ray, laboratory, heliotherapy, and occupational therapy.

The Hospital Permit Bureau has a full-time physician in charge, and a corps of medical social workers and clerical personnel to determine eligibility and issue permits to hospitals and clinics.

Physicians-to-the-Poor or City Phy-

sicians (12 in number) in their respective districts render domiciliary care on part-time salary to the indigent sick, while two others are assigned to emergency service throughout the District.

The Ambulance Service consists of government-owned ambulances for transportation of patients to and from hospitals, and there are also contracts with two private hospitals for emergency ambulance service to transport emergency cases to hospitals for outpatient and hospital emergency care.

The department also administers contracts with two private hospitals for the care of emergency cases and with another for the care of indigent sick children.

COÖRDINATION AND CONTINUITY OF SERVICE

A review of the several bureaus of the Health Department proper indicated that correlation of the work of the Bureau of Maternal and Child Welfare with the hospital services offered the greatest opportunity for immediate results. The infant mortality rate for Washington in 1936 was 72.0, the second highest among the 13 largest cities in the United States of above 500,000 population, and this in spite of the fact that previous well intentioned efforts to offset high infant mortality in Washington had resulted in the delivery in the hospital of more than 90 per cent of all patients, both white and colored. Under this program of hospitalization at Gallinger Hospital patients overflowed from the wards into the corridors, and even then it was necessary to establish a 30 bed overflow ward and nursery in an unused wing of the psychopathic building at a distance from the obstetrical department. This resulted in disorder and seriously overburdened the nursing staff. The superintendent of the hospital, a most resourceful person, rightfully stated that

he could not turn these patients away when they appeared at the hospital actually in labor.

There was a very evident flaw in the obstetrical program for the care of the indigent in the community which apparently could not be removed prior to the amalgamation of the health and hospital program. The Health Department operated prenatal clinics in the community with competent physicians in charge and public health nurses to assist with the clinic and field program, while the Board of Public Welfare did everything possible to care for those who came to the hospital in labor. Yet year after year the Health Department gave prenatal instruction to an average of only 600 patients, in spite of painstaking efforts to get patients to the clinics, while more than 2,000 indigent patients were delivered yearly at Gallinger Hospital, mostly without prenatal care. The disproportion between prenatal clinic patients and hospital deliveries furnished the key to the perplexing situation. To rectify this condition, soon after amalgamation of the health and hospital services, the Hospital Permit Bureau was instructed to issue no hospital permits for obstetrical patients until approval had been issued by the Clinical Director of Maternal Welfare. The result was an increase in prenatal patients from 600 to more than 3,000 within one year, while the hospital deliveries decreased from 1,956 in 1937 to 1,683 in 1938. It was, therefore, possible to close the obstetrical annex ward at Gallinger Hospital and to clear the corridors of patients, without new financial outlay for capital construction and maintenance. What became of the excess number of patients who otherwise would have been delivered at the hospital? Arrangements were made with the outpatient delivery services of Georgetown, George Washington, and Howard Universities for delivery of patients in the home by students under

direction of competent obstetricians.

In actual practice the Clinical Director of Maternal Welfare reviews histories of all prenatal patients 6 weeks before the expected date of confinement. He also reviews the report of the public health nurse as to whether conditions in the home are suitable for home delivery. An unsatisfactory physical or home condition warrants hospital delivery, the patient is instructed to apply at the Hospital Permit Bureau for permit to enter the hospital, and the Nursing Bureau and Permit Bureau are apprised of this decision. A report of the patient's physical and home condition is forwarded immediately to the hospital. In case home delivery is decided upon, the physical history is forwarded to the medical school outpatient delivery services, and nurses assist the patients in making necessary preparation.

After delivery a brief report of the obstetrical history is forwarded from the hospital or medical school outpatient services to the Bureau of Maternal and Child Welfare where it is recorded for future reference. A close working relationship has been established between private agencies and the Health Department, resulting in an extensive community program. There are now more than 4,000 prenatal patients receiving care by the department constantly, out of a total of 13,981 births for the city, and more than 500 prenatal cases are currently being treated for syphilis.

The fall in the infant death rate has been rapid, from 72.0 in 1936 to 61.0 in 1937, 48.1 in 1938, and 48.0 in 1939. Sharing in this record of reduced infant mortality has been the strengthening of facilities for continuity of care between the obstetrical services and the infant and child guidance clinics. It is believed that still further mortality reductions will be made through the inauguration of improved nursing routine in institutions for the care of

infants, particularly of prematures, which is now in the process of development at Gallinger Hospital.

The establishment of coördination and continuity of care for other bureaus with the hospital services, while probably not as dramatic from the point of view of mortality reduction, are nevertheless important. Among these may be mentioned tuberculosis, venereal disease, pneumonia control, and the service of physicians to the poor.

Washington during the years has gained an unenviable reputation for high tuberculosis mortality. An analysis of the underlying causes giving rise to conditions which place the city in second place among the 13 cities of above 500,000 population, need not be given here. Suffice it to say, however, that the nation's capital, with a population of 663,000 according to the 1940 Census, had the greatest percentage growth of all cities in its population group. Among its 176,000 Negro population the tuberculosis death rate was 225.7 in 1939, while that for the white race was only 35.7, which is surprisingly low.

The period of hospitalization and supervision of tuberculosis patients is long even under optimum conditions. For others, notably the chronic fibroid, sputum positive cases, it is practically endless. The medical, nursing, and sociological problems that arise in regard to these cases tax the endurance of directors of tuberculosis divisions and hospital authorities. The amalgamation of the health department and hospital services has made it possible for staff conferences to be held within the department where representatives from the hospitals discuss problems of the management of individual cases with the personnel of the Bureau for Tuberculosis Control and vice versa, at which conferences the public health nurses and medical social workers are also in attendance. These conferences are held

alternately at the Bureau for Tuberculosis Control on the one hand, and at the hospitals on the other. They have proved to be indispensable in the program of tuberculosis control, which is continuous and uninterrupted through the clinics and hospitals.

Still another advantage accruing out of the combined services of the department and hospitals, particularly important in tuberculosis control, is the fact that a law has recently been passed which gives the Health Department authority to hospitalize communicable disease patients when the Health Officer states that it is in the interest of the public health.

Venereal disease control has been facilitated by the combined health and hospital services, although several years elapsed before the department was able, because of the lack of funds, to promote and coördinate the health and hospital services of the department in an effective plan. A long felt need of a venereal disease ward at Gallinger Hospital was provided, however, for acute, fulminating cases, or those who refused to comply with the regulations governing the control of venereal diseases. This service is available for both sexes, white and colored. The hospital also furnishes opportunity for the evaluation of the newer methods of therapy. The venereal disease control staff of the department and the hospital physicians have instituted carefully planned and controlled experiments which should add considerably to our knowledge of prevention and cure. Funds obtained from the U. S. Public Health Service grants for venereal disease control will very materially aid in the promotion of this work.

One of the most striking instances of reduction of mortality has occurred in connection with the pneumonia control program. Late in 1937 a pneumonia control service was inaugurated by the Department of Health and Hospitals in

coöperation with the white and colored medical societies. Two pneumonia consultants were added to the health and hospital staffs to assist private physicians in the management of cases and also to serve as consultants to the hospital staff in the care of indigents. In 1936 the death rate from pneumonia was 139.0. It dropped to 121.4 in 1937, 87.1 in 1938, and 72.3 in 1939. Complete laboratory services and serum and drug therapy for all types of cases are furnished by the department for the indigent.

Domiciliary medical care of the indigent in Washington is given by 14 practising physicians on part-time service. Twelve of these have specially assigned districts, while two are on emergency call constantly. These physicians treat many cases in the home who otherwise would be cared for at the hospital, which is not only costly, but unrestricted hospitalization also taxes the capacity of the hospital medical and nursing services. Monthly conferences are held for discussion of problems relating to domiciliary, outpatient, and hospital care. Attendance is required of the city physicians, the director of the Hospital Permit Bureau, the pharmacist in charge of the Health Department Drug Dispensary, the admitting officer at Gallinger Hospital, the director of the Medical Social Service Bureau, and frequently representatives from the Public Health Nursing Bureau and the Instructive Visiting Nurse Society attend.

The Hospital Permit Bureau, as the name implies, is responsible for the issuing of permits to the Health Department hospitals and the private contract hospitals. Patients admitted to these institutions must have resided in the District of Columbia for at least one year and be unable to bear the cost of hospitalization. The law provides exceptions for psychiatric, communicable disease, and tuberculosis patients. Resi-

dence eligibility and rates for these patients are determined by the Permit Bureau.

The work of the Permit Bureau is considered extremely important in that it provides a check and prevents pyramiding of costs to the taxpayer. It is believed that, unless this service is provided, any medical care program from the start is doomed ultimately to failure because of mounting costs. While hospital superintendents and their administrative staffs are responsible for collections, responsibility for determining eligibility and the rates of pay is vested in an autonomous admitting bureau under supervision of the Health Department which not only determines eligibility and fixes per diem costs but administers contracts with private hospitals for emergency dispensary and hospital care, including ambulance service. Contracts with private hospitals stipulate rates of pay for these services and all hospital bills for service rendered must be painstakingly examined and approved by the Director of the Permit Bureau before vouchers for payment are drawn.

MEDICAL SOCIAL WORK

The rôle of the medical social worker is fully recognized and appreciated in any large hospital plan of administration. The decision to establish a Bureau of Medical Social Service as an integral part of the Health Department organization grew out of the recognition of the importance of trained social service workers in any scheme of medical care and through necessity for co-ordination of medical social activities within the Department of Health and Hospitals. Previously the department had on its pay rolls a total of 13 medical social workers in the two hospitals, the Permit Bureau, and the Venereal Disease Bureau. Little or no efforts were made to establish continuity of care, and each group operated separately within

its particular sphere. A full-time director of medical social service was appointed and authorized to work out the details of unification of all social service activities within an autonomous bureau. This arrangement is highly successful, and that portion of the service which is concerned with hospital and clinic admissions is quite indispensable.

CONCLUSION

The present arrangement for health and medical care in the District of Columbia has now been in operation three years. An appraisal of the work can be made by the reduction in mortality and the response of the public and the medical profession. Outstanding mortality reductions have already been enumerated; the coöperation of the public has been most encouraging, in fact, almost universally approving, as shown in the failure of a proposal to return the hospitals to their former status under a reorganization plan for the District of Columbia. In hearings before the Commissioners 18 out of 19 civic organizations publicly opposed a change. Included among these were the Board of Trade, the Citizens' Associations, the Federated Women's Clubs, the Parent Teachers Association, the Manufacturers' Association, and a host of smaller organizations. The Commissioners themselves subsequently expressed their disapproval of any change in the status quo.

The local medical profession has supported the department on numerous occasions. Most recently it has proposed the establishment of a Bureau for Cancer Control under the Health Department with a full-time director in charge. The profession itself recognizes the responsibility of government in the care of the indigent sick, and it is believed that the local medical groups appreciate the desire of the department to protect the taxpayer and the profession

itself through the inauguration of procedures to bring medical care more abundantly to the indigent sick, who have been unable to share in all the benefits that modern scientific medicine affords.

There is difference of opinion among health officers as to the advisability of the extension of health work to include general medical care of indigent groups. It is difficult to believe that this view can long prevail because of the considerable amount of emphasis that is now being placed upon the public health importance of the degenerative diseases of middle and old age groups. Probably in the future more assistance will be given to these groups, among whom there has been significantly little reduction in mortality during this century. The mounting death rates from heart disease and cancer are appalling, and as the middle and old age groups of the population increase numerically the problems of prevention among these groups are linked more and more with domiciliary, clinic, and hospital care.

At the beginning of the century, problems of the control of typhoid fever, diphtheria, and tuberculosis were paramount and required the greater part of the time of health department personnel. Today these diseases in most communities have been successfully attacked and are approaching eradication because of the application of sound public health methods. In the minds of many there is no longer need for the extension of facilities for care of communicable disease cases in hospitals, and in some communities plans for the future are being directed toward provision for the care of older age groups. If the problem of the control of communicable diseases is reduced to a greater extent in the future, it appears that public health will have reached a goal.

There is little doubt that most large health departments are fundamentally

equipped to assume larger rôles in any public health program of the future. The guiding minds that organized prenatal obstetric outpatient delivery service, child guidance clinics, tuberculosis and venereal disease control bureaus, and extensive typhoid and diphtheria control measures are amply equipped through training and experience to assume a rôle in the preventive medicine of the future which may embrace all or at least a part of the administration of medical care for the indigent. Nowhere in the community today may there be found individuals who through training or experience are so well equipped as are health officers to assume the larger administrative functions of prevention and medical care. It is admitted that the health officer, obligated with such responsibilities, will be called upon to establish new relationships and organize services not in line with past responsibilities; but since he has been called upon to organize medical bureaus and

select personnel for administration within his department, he can with a like degree of efficiency select hospital superintendents or other responsible personnel to administer new medical care services.

The experience of the District of Columbia Health Department indicates that the amalgamation of Health Department and hospital services has resulted in better medical care, with consequent lowering of mortality from preventable conditions especially; it has reduced costs to the taxpayer because of established continuity and better routing of cases for domiciliary or hospital care, and improved the program of prevention, because the Health Department stands in close relationship to the hospitals where communicable diseases and other preventable conditions are treated.

REFERENCE

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Control of the Venereal Diseases in Civilian Areas Adjacent to Concentrations of Armed Forces*

A. B. PRICE, M.D., AND F. J. WEBER, M.D.

*Passed Assistant Surgeon, Louisiana State Board of Health, New Orleans, La.;
and Assistant Surgeon, U. S. Public Health Service, Regional District 4,
New Orleans, La.*

THE present limited emergency has brought into focus certain problems of public health in those areas where military or naval forces are assembled. Prominent among these is the problem of venereal disease control which, because of the many social and medical factors involved, is particularly difficult of solution. A satisfactory solution of this problem, however, is imperative.

During the past year the authors have actively engaged in venereal disease control in two of the large maneuver areas in the southern states. As a result of this work we have come to recognize the necessity of certain procedures and have, likewise, been in a position to judge the efficacy of such measures in the control of venereal disease. Therefore, we propose in this paper to discuss the special nature of the problem in training areas, together with what we believe to be practical proposals for its solution.

Available records indicate that the great majority of sexual exposures of enlisted men is with prostitutes of one sort or another. In one of the areas studied during the winter of 1939-1940,

112 men of 120 questioned named a prostitute as the source of their infection. Since prostitutes are admittedly a highly infected group, the extent of the danger is more clearly evident.

In this same area, 180 women engaged in the practice of prostitution were subjected to medical examination and 37 per cent were found to be infected with syphilis and 10 per cent with gonorrhea. We were limited by existing circumstances to the employment of one and, at the most, two vaginal smears in the diagnosis of gonorrhea in this group. Therefore, we feel that better diagnostic facilities would have revealed a greater number of gonococcal infections than were actually discovered.

That age old institution, the "red-light" district, is not the only factor with which venereal disease control officers and law enforcement authorities have to contend. Within the past decade, the mushroom growth of the "honky-tonk" (combined dance hall and beer parlor), the roadside cabin, and the peripatetic operator whose activities are abetted greatly by the development of modern transportation, have all combined to complicate the problem. For example, in the maneuver area mentioned, 63 venereal disease patients of

* Read at a special session on The Control of Venereal Diseases in a National Defense Program of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

120 questioned attributed their infections to prostitutes employed in "honky-tonks" while only 15, or 12 per cent, named inmates of recognized houses of ill-fame.

Of the venereal infections contracted by troops, gonorrhea exceeds all others in number. The incidence of this disease in the maneuver areas studied was found to be 4 to 10 times greater than syphilis, while cases of chancroid, lymphopathia venereum and granuloma inguinale were of infrequent occurrence. This high attack rate for gonorrhea is a serious problem, inasmuch as it means a loss of many days from duty and greatly augments the cost for hospitalization of troops.

In evaluating various procedures to meet the situation, the authors feel that a *sine qua non* in such training areas is the presence or establishment of full-time local health services manned with qualified personnel. This is essential to the development of a complete liaison between military and civilian authorities in matters of mutual health concern. In this way, venereal disease control can be correlated more effectively with other important health activities which are necessary to safeguard the health of both troops and civilians.

As a necessary corollary, it follows that military and naval officials should exercise close coöperation on their part with local and state health authorities. Since the public health situation in the training center and the adjoining civilian area is a matter of concern to both, provision should be made for the exchange of pertinent information in health matters of mutual interest. This is best accomplished where all such information is transmitted through one authorized individual acting in the capacity of liaison officer between the military and civilian organizations. In some instances the local health officer may perform this function, but in large training areas where armed forces are present in con-

siderable numbers, this work can be done more effectively by a specially designated officer who assumes the responsibility for correlating public health activities and who can effect the liaison between the civilian and military or naval authorities.

General experience indicates that, other factors being equal, the prevalence of venereal disease in any given area tends to be in direct proportion to the number of sexual exposures which occur. This seems to be true in our experience, for we have observed the highest rates among enlisted personnel stationed in the vicinity of communities where prostitution was permitted to flourish and where sexual exposures with this class were frequent. Therefore, the first question to arise is how the number of contacts with such infected persons may be appreciably reduced.

In the course of our work we often hear arguments advanced for the institution of segregated districts with licensed inmates who are subjected to periodic medical examination. It is our belief that, aside from obvious social and moral considerations, such a system should be prohibited because it has proved to be a universal failure wherever tried, in so far as the prevention of venereal disease is concerned. The extensive studies of Flexner, Johnson, *et al.* demonstrate that only a comparatively small number can be so segregated; that a rapid turnover in the inmates of such districts is a recurring phenomenon; and that medical inspection is barren of any genuine results for reasons that are obvious to students of venereal disease.

The repression of prostitution is a community responsibility and one over which military authorities have no direct control. Therefore, an effective solution of this problem will depend upon strict enforcement by the police powers of existing laws dealing with the practice of prostitution. However, such

enforcement to be effective requires a responsible public opinion to back up police officials. In addition, such law enforcement must not only be concerned with the activities of prostitutes themselves, but extend as well to the owners and operators of houses classed as brothels, tourist camps used for immoral purposes, as well as "honky-tonks," hotels and rooming houses where open or clandestine prostitution is tolerated. Also, where troops are on the march, police officials will have to be alert for camp followers who always serve to aggravate the local situation.

The writers recognize the fact that such enforcement measures are not always easy to execute. However, wherever they have been earnestly applied, the results have been well worth the effort in terms of diminished exposures to women of this class.

Assuming that the civilian community is doing its part in the repression of prostitution in whatever form it may exist, what further steps should be taken by the civilian and military or naval officials to decrease the incidence of venereal disease in their respective populations? Inasmuch as both the civilian and military groups have a mutual obligation, how may they most effectively unite their efforts in the matter of venereal disease control?

First, let us state that the responsibility for making early diagnosis, rendering specific treatment and the employment of good epidemiological procedures, rests on both. In the case of early diagnosis and treatment, the armed forces enjoy an advantage over most civilian communities because of invariably excellent facilities for such diagnosis and treatment, together with the fact that better control of patients can be exercised. On the other hand, in many civilian communities it is hardly to be expected that venereal diseases will be recognized as promptly and treated to the point of non-communicability or "cure."

Since many of these individuals have frequent sexual contacts with the military population, one of our main problems is to find a way to detect such infections earlier so that specific treatment can be instituted.

Therefore, with the object of bringing as many as possible of these civilian sources of infection under control, a system has been devised in coöperation with military and naval officials in which an attempt is made to identify and locate the source of infection in the case of each enlisted man contracting a venereal disease. We have found that the employment of a simple questionnaire filled out at the time diagnosis is made proves quite helpful in identifying sources and contacts. This questionnaire embodies such essential information as the following:

Name of patient
 Diagnosis
 Date and place of intercourse causing infection
 Name and address of woman, if known
 Physical description and attire of woman
 Method of procurement
 Prophylaxis taken
 Sobriety of patient

In using this form, promptness is essential on both the part of the medical officer who completes the form and the health officer instituting the investigation, since a difference of a few hours frequently decides the result. In large training areas where sexual exposures are apt to be many, it has been found best to entrust the analysis of the data contained in these sex contacts forms to a specially designated liaison officer who has the authority to take appropriate action in conjunction with local governing officials.

This information is given quite willingly by the enlisted man and in our experience refusal or dissimulation is rarely encountered. In most cases, the full name of the contact is unknown and usually a first name or nickname is

all that can be obtained. However, other data such as physical description and place of exposure is surprisingly good and often leads to a detection of the source. This is particularly true where one woman has transmitted infection to several men. To give an example from our recent experience, a prostitute was located who was apparently responsible for the development of gonorrhea in at least 8 men. All 8 patients gave a remarkably uniform physical description of their contact, although the latter individual was a street walker and the exposures occurred at different places and at different times. With this description the police were able to locate the woman in one of her usual haunts and have her report for examination and treatment.

The successful tracing in the instance cited is an example of how the police may prove of great assistance in problems of this kind. Since most professionals are known to the man on the beat, a good description will often suffice even in the absence of other data.

In some areas a similar sex contact form is filled out at the time the enlisted man takes prophylaxis. Although the disclosure of such information is optional, our experience thus far indicates that refusals are rare, and it is our belief that this procedure does not discourage the individual from reporting for prophylaxis. This information is then turned over to the maneuver area health services, thus yielding valuable clues regarding the location of prostitutes in advance of the occurrence of clinical cases. This proves particularly helpful where troops move from one region to another and some develop clinical manifestations after leaving the area where infection was acquired.

Epidemiological procedures of this nature must, of necessity, be carried out in the face of many difficulties. We can, of course, expect no genuine coöperation from the infected prostitute in having

her reveal the names of her sex contacts, even if she knew or could remember. Therefore, our main reliance must be placed upon the testimony of the men infected, together with the degree of detective skill developed by health officers working with the problem. Unless everyone concerned joins whole heartedly in a united effort, venereal disease control in these areas will be difficult.

It is obvious that any community faced by this special problem should be conducting a good general venereal disease program. Existing diagnostic and treatment facilities should be increased if they are inadequate. If a sound program is already in operation, the health officer can institute certain anticipatory control measures before large troop concentrations assemble in his area. A roster of all female employees in establishments serving food and drink may be prepared and a routine examination for communicable disease should be conducted, including the performance of at least one standard serological test for syphilis. This roster should prove to be of great aid later when cases of venereal disease are reported in troops, since many of the sexual contacts of enlisted men are with individuals of this group. The proper enforcement of sanitary regulations may succeed in closing some of the worst type of cafes, beer parlors, and tourist camps, or have the effect of dampening some of their activities.

The health officer may find the local medical society to be of valuable assistance. It is not uncommon in some places for certain physicians to issue medical certificates to prostitutes asserting freedom from venereal disease. As a result, prostitutes in possession of these certificates regard them as a license to operate and by their display lull patrons into a false sense of security. By taking up this matter at one of the medical society meetings, the health officer will usually succeed in having the practice discontinued.

Education, of course, plays a large part in the program. The public should be informed not only concerning the dangers of venereal disease and how such disease can be recognized in its early stages, as well as the importance of early treatment, but should also be told of the measures taken for its protection, including the location of treatment centers.

Another important aspect of the venereal disease program is that due consideration should be given to the wider prevalence of gonorrhea. Unfortunately, this disease has been much neglected in the past, and most attempts at its control have been spasmodic. The diagnosis of gonorrhea in women, particularly where it exists in chronic form, offers quite a problem inasmuch as we lack a simple scientific test that is comparable to the standard serologic tests for syphilis in sensitivity or specificity. Bacteriological smears fall far short of the ideal, while culture methods are difficult and time consuming, an important point to consider in problems of this nature where time is such an important factor. In this work, many cases of gonorrhea will escape detection if positive bacteriological evidence is required. Therefore, in deciding whether or not to treat, it appears reasonable enough to accord due weight to clinical and epidemiological findings indicating the individual to be a purveyor of gonococcal infection even though gonococci cannot be demonstrated.

In addition to providing adequate diagnostic and treatment facilities for its citizens and assisting in establishing necessary prophylactic stations in convenient and desirable locations, community leaders should offer their fullest coöperation to army and naval officials in providing for the welfare of enlisted men who visit the community during off-duty hours. They should coöperate in instituting and maintaining healthy recreational facilities for men on leave and make a genuine effort to lead them to amusements and pleasures that will improve rather than deplete their mental and physical energies.

In the final analysis, the worker in this particular field will have to trust his own personal judgment in dealing with many of the situations that develop. Ways and means must be devised through which established principles of venereal disease control may be applied to the special problem considered here. The health officer's course should be pursued with tact, but without losing sight of his objective, and the attainment of that objective will depend in large measure upon how successfully the parties concerned can be persuaded to discharge their full duties.

In conclusion, we can state that the outlook for venereal disease control in the training areas is favorable. We hope that the presentation of this subject will stimulate interest in a very important matter which vitally concerns adequate preparation for the national defense.

An Outbreak of Endemic Typhus Fever in Nashville, Tennessee

Its Epidemiology and Control

C. B. TUCKER, M.D., THOMAS V. WOODRING, M.D.,
AND HARRY C. ESSICK

Director, Division of Preventable Diseases, Tennessee Department of Public Health; Assistant Health Officer, Nashville, Tenn.; and Senior Sanitary Inspector, U. S. Public Health Service, Savannah, Ga.

ENDEMIC typhus fever is known to have been present in the south-eastern states as early as 1913. Dyer¹ has indicated that the gradual increase in the number of reported cases in southern states from 1923 to 1931 might be explained by increased recognition of cases by physicians but that the sharp increases in 1932 and 1933 surely could not be explained on those grounds alone. As pointed out by Dyer¹ and by Baker, McAlpine, and Gill,² the disease since 1929 has shown a tendency to spread inland from the Atlantic and Gulf coastal cities.

The first case of endemic typhus reported in Tennessee was in 1926 as shown in Table 1. Prior to 1925 no records of morbidity were kept by the Tennessee Department of Public Health and, therefore, nothing is known as to

the occurrence of cases before that year. Some doubt may be raised as to the accuracy of diagnosis or as to the source of the infection in 6 of 9 cases reported during the period 1926-1934. Prior to 1934 no separate account was kept of nonresident cases. Three cases reported between 1926 and 1934 were known to be nonresident cases.

Among the 159 cases reported during the period 1935-1939, 28 were reported from strictly rural regions and may not have been endemic typhus fever. In 1939, 8 cases reported from rural areas as endemic typhus fever were found upon investigation to be: Rocky Mountain spotted fever in 6 instances, tular-emia in 1 instance, and a *Salmonella* infection in 1 instance. These misdiagnosed cases give sufficient reason to doubt the diagnosis of a number of cases reported in the past as endemic typhus fever.

TABLE 1

*Endemic Typhus Fever Cases Reported in
Tennessee, 1926-1939*

Year	Number	Year	Number
1926	1	1933	1
1927	0	1934	0
1928	2	1935	8
1929	2	1936	6
1930	0	1937	21
1931	1	1938	24
1932	2	1939	100

FEATURES OF THE OUTBREAK

A considerable outbreak of typhus fever occurred in Nashville in the autumn of 1939. Nashville serves as a freight terminal on the Cumberland River and, besides being a river terminal, it is an important railway center

for three railroads and is a trade center for central Tennessee, south-central Kentucky, and northern Alabama. There are various local industries, among which are grain mills, feed mills, wholesale groceries, and other establishments handling foodstuffs of different kinds. The estimated population of Nashville for July 1, 1939, was 166,312. Of this number 120,006 (72 per cent) were white, and 46,306 (28 per cent) colored.

Incidence—In 1935 endemic typhus fever was first definitely diagnosed and reported among residents of Nashville, 6 cases being reported that year. In Figure 1, there are three areas marked 1, 2, and 3 which represent probable foci of endemic typhus infection among rats. Four of the 6 cases in 1935 occurred among employees of a large feed mill in Area 1 and among residents of the immediate vicinity. The mill is

located adjacent to the main lines of the Nashville, Chattanooga, and St. Louis and the Louisville and Nashville Railroads, a short distance north from where the two railroads converge and extend to the freight and passenger terminals. It seems reasonable to believe that infected rats were on freight cars entering the city from the south, and left the train to feed or were unloaded with bulk grain at this mill. Subsequently, a definite focus was established among rats having harborage in the mill and its immediate vicinity. It is probable that this was the first focus to be established in Nashville. However, infected rats had probably extended to other areas before cases occurred or were recognized in Area 1, because 2 other cases were reported in 1935 in individuals whose place of employment was just north of Area 2.

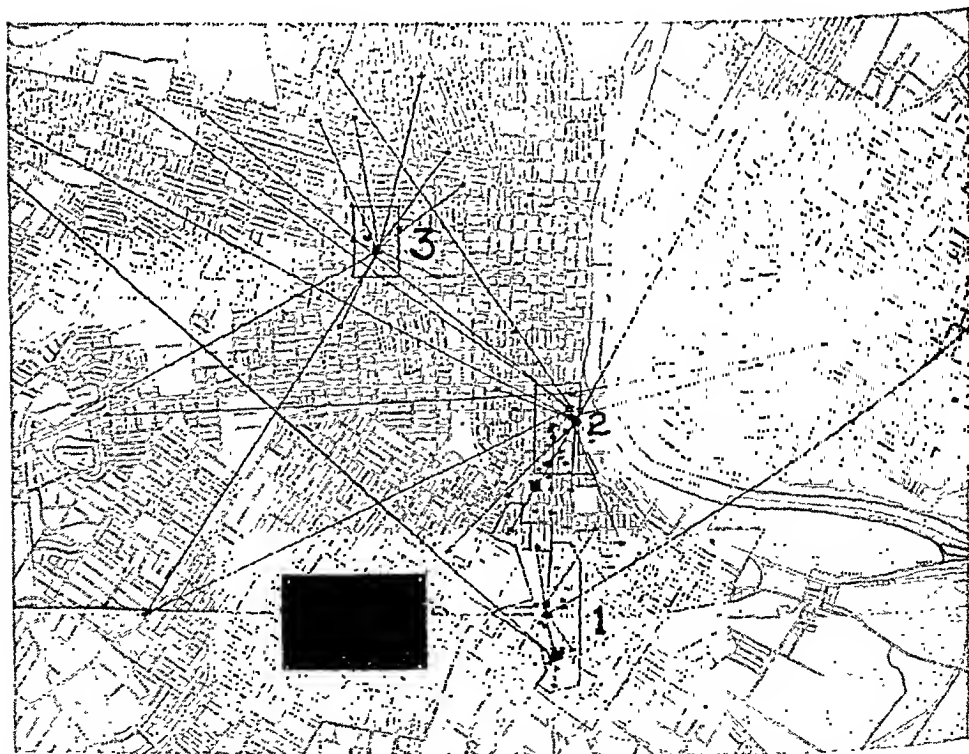


FIGURE 1—Typhus fever in Nashville, Tenn., during 1939. Black dots represent residences of cases. Lines extend from residences of cases to foci of infection. Three areas are marked denoting location of intensive rat control measures.

In 1936, 2 cases were reported among employees of the mill in Area 1, and 1 other case in a person whose place of employment was just north of Area 2. In 1937, 13 cases were reported in the city. Two of these were employees of the same mill in Area 1, and 3 were residents of the immediate vicinity. Six cases were reported in employees of a feed mill in Area 2, with probable source of the remaining cases unknown. Of the 9 cases reported in 1938, 2 were employees of a poultry house in Area 2, and 7 were employees of two grain mills in Area 1. During 1939, 75 cases of endemic typhus fever were reported to the City Health Department. In addition, 5 cases in persons living in Davidson County outside the city gave histories which suggested that their source of infection was in Nashville.

Seasonable Distribution—The dates of onset, by months, of the cases reported in 1939 were as follows:

January	3
July	1
August	1
September	20
October	23
November	24
December	3

From these figures it is seen that 67 of the 75 cases occurred in September, October, and November. In states to the south and southeast^{2, 3} the first cases have usually been seen in June or July, the incidence reaching a peak in September, followed by a decline in Oc-

tober and November. Perhaps some differences in temperature, humidity, or a combination of factors affecting the rat flea play a part in the later seasonal incidence of the disease in Tennessee.

Geographical Distribution—The place of residence for each case reported during 1939 is spotted on the map (Figure 1). The probable source of infection is indicated by lines extending from the residences to the different foci. No lines are seen extending from the residences within each area or from residences of patients where no source of infection could be determined. By careful history taking it was possible to determine the probable source of infection in 70 of the 75 cases.

Occupational Influence—The cases for which the source of infection could be determined were either in employees at or in visitors to grain mills, seed stores, groceries, restaurants, and poultry houses, or among persons living or working in buildings in the immediate vicinity of such places which offered generally good harborage for rats.

Two of the cases were in persons whose occupation was that of commercial rat exterminator. Another case was in a policeman whose area of duty was in a residential section of the city but who spent several hours each Saturday morning in a barber shop which was adjacent to a poultry house in Area 2. Two barbers working in this shop had the disease at about the same time as the policeman.

TABLE 2
Distribution by Color, Sex, and Age of Cases of Endemic Typhus Fever Reported in Nashville, Tenn., in 1939

Age Group	Total		White		Colored	
	Male	Female	Male	Female	Male	Female
All Ages	55	20	43	17	12	3
0-9 years	1	1	1	1	0	0
10-19 years	2	2	2	2	0	0
20-29 years	13	5	12	4	1	1
30-39 years	12	2	10	2	2	0
40-49 years	10	4	6	4	4	0
50-59 years	12	4	8	4	4	0
60-69 years	5	1	4	0	1	1
70 years and over	0	1	0	0	0	1

Color, Sex, and Age Distribution—Table 2 gives the color, sex, and age distribution of the cases. Sixty (80 per cent) of the cases occurred in white persons, and 15 (20 per cent) in Negroes. This is a rate of 50 per 100,000 population for whites and a rate of 32.4 per 100,000 population for Negroes.

In order to have a complete record of cases, the employers of the major food-handling establishments in the three areas were requested to report absences from work. Visits were made to the homes of employees when reports were received. Twelve cases among Negroes were found by these investigations. Of the 12 cases, 5 were not under the care of a physician. The others had been seen by physicians and their illness diagnosed as typhoid fever, malaria, influenza, or some other condition.

Twenty-one cases, 9 of which were white, and 12 colored, occurred among employees of four large feed mills. These mills employ 334 persons, 119 of whom are white, and 215 colored. The attack rates in this small population were 7.6 per cent among the white employees, and 5.6 per cent among the colored employees. Although no general conclusion can be drawn from these figures, it appears that here the incidence of the disease was nearly as high among the colored race as among the white race.

The mild manifestations of the disease and the lack of medical care may be responsible for failure to diagnose and report some cases among Negroes. Baker, McAlpine, and Gill,² in discussing the epidemiology of the disease in Alabama, state that reported cases have been ten times as common in the white race as in the colored race. They later add that the apparent high case fatality rate among Negroes in that state may to a considerable extent be due to less complete recognition and registration of cases for this group. Only in a large population in which all white

and colored people are equally exposed and cases are accurately recorded could a definite decision be reached with regard to racial susceptibility to this disease.

The disease was more common among adults than among children and more common among males than among females. This is usually the case, since endemic typhus fever is in the main a disease occurring among employees in certain industries.

Clinical Manifestations—The clinical manifestations were in the main similar to those which have been previously described.¹⁻⁶ A rose to dark red, macular (in some instances maculopapular) rash was first seen in the majority of cases on the 5th or 6th day of the disease. The rash usually appeared first on the lower chest or upper abdomen. The erythematous lesions did not become definitely petechial or hemorrhagic except in 2 patients. It has been stated⁴ from observations elsewhere that the rash becomes petechial in the severest cases. In Tennessee it appears that a petechial eruption is an exception rather than a rule. This point is of value in the differentiation of this disease from Rocky Mountain spotted fever.

In the colored patients no rash could be definitely observed, although in 4 cases lesions were present which were suggestive of a rash but could not be differentiated from natural blemishes. No rash could be observed in 2 of the white patients.

The average duration of fever in hospitalized cases was 15 days. The maximum duration was 40 days (including complications) and the minimum 9 days. Forty-five (60 per cent) of the patients were hospitalized.

Agglutination of *Proteus* X-19 organisms with the blood serum of patients was present in significant titers (1:160 or more) in 73 patients. Agglutination tests with the serum of 2 patients were not made, but the clinical

and epidemiological manifestations were such that there appeared to be no question as to the diagnosis.

Two cases resulted in death, giving a case fatality rate of 2.7 per cent. Each of these cases died of a complicating pneumonia. One of the patients who died was a white male, age 65, and the other a colored female, age 60.

THE CONTROL PROGRAM

In the latter part of October, 1939, when it became evident that Nashville was experiencing a severe outbreak of endemic typhus fever, the Health Officer of Nashville, through the Tennessee Commissioner of Public Health, requested the U. S. Public Health Service to assist in the institution of rat control measures in this city. One of the authors, a sanitarian of the U. S. Public Health Service, was detailed to Nashville for that purpose. Prior to this time a sanitarian of the City Health Department, who was given training in rat control by the Tennessee Depart-

ment of Public Health in 1937, had given some assistance to local business concerns in rat control.

The epidemiological picture of these known focal areas gave sufficient evidence that rat control measures should be concentrated first in these areas, in order to destroy as many infected rats as possible, and to prevent the infection from spreading to other areas if it had not yet done so. The method employed was essentially that which had been developed in Georgia jointly by the State Department of Health and the U. S. Public Health Service.⁷

In order to prevent the driving of infected rats out into the surrounding area, the program was started several blocks in radius from the main foci of infection with the plan of working inward toward the center of each focal area. The heavy lines shown around each area in Figure 1 signify the location where work was started. A large warehouse or grain mill near the center of the area was selected as the final

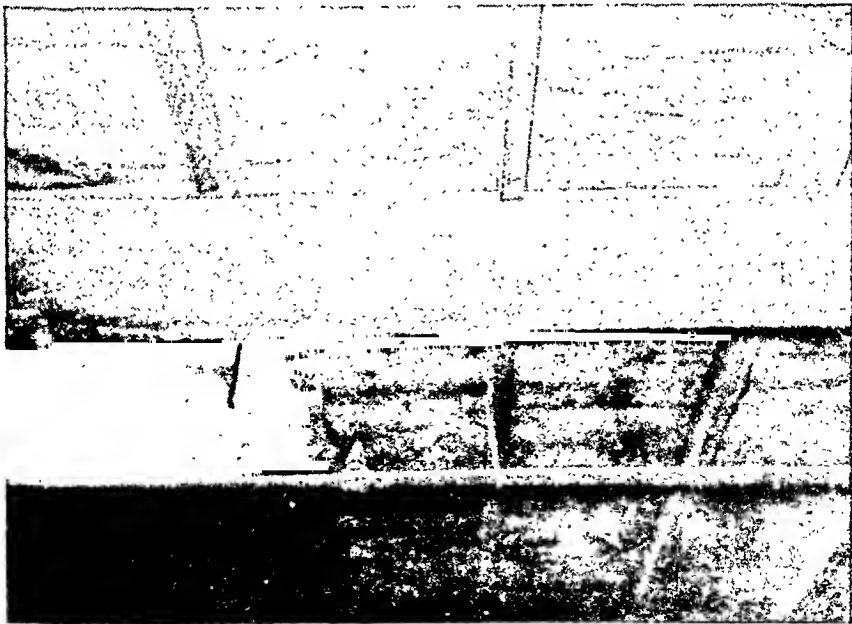


FIGURE 2—Rat run in a building whose floors and walls were covered with grain flour. Note white marks made by tails of rats.

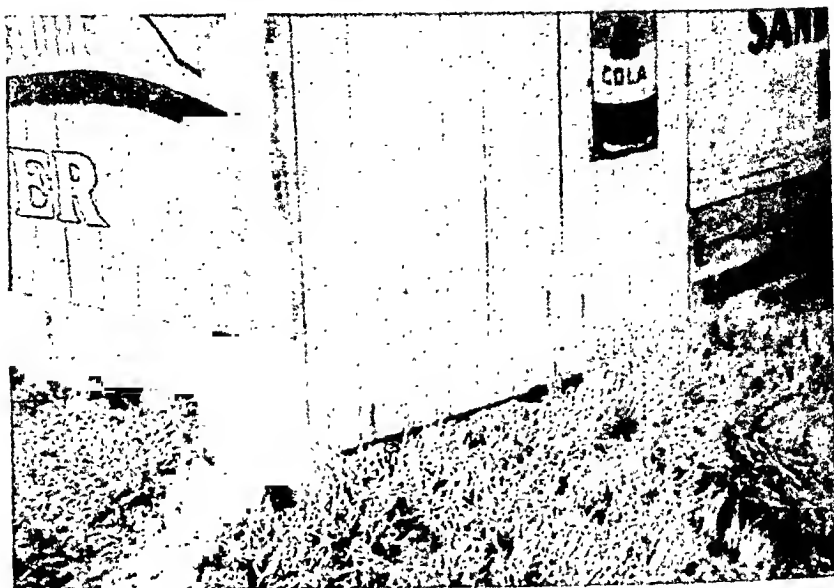


FIGURE 3—A wooden building close to the ground. Rat runs may be seen through the grass and under the building.

location for completing the work. Figure 2 shows visual evidence of rat runs in such a building.

Thirty men employed by the city as laborers were divided into three groups with two sanitarians of the City Health Department as supervisors of each group. The workers in group 1 were used to clean the area by removing garbage, refuse, and trash; those in group 2 were used in gassing, poisoning, and trapping; and those in group 3 were used in rat-proofing buildings. A U. S. Public Health Service truck built for mosquito control work, equipped with an air compressor and 500 feet of hose, was used to supply compressed air for gassing purposes. Gas hand-pumps were connected to the hose, and buildings and burrows were gassed.

Starting at the periphery of the area and working toward the center, garbage, refuse, and trash were removed and alleys, basements, outhouses, and yards cleaned. In order to prevent rat harborage, material worth salvaging was stacked 2 feet off the floors and ground. Rat burrows were gassed with cyanide

A dust and the openings closed with earth. Poison bait and traps were repeatedly placed in sections cleaned until the entire area was covered. By this method a clean, presumably rat-free area was established between central portions of the area and the surrounding territory.

As foodhandling establishments were reached, a survey of the buildings was made to discover the places where rats could enter (Figure 3). The owners of these establishments furnished the materials and the laborers employed by the city did the rat-proofing. All ventilators and sidewalk gratings were closed with 16 gauge galvanized iron sheeting perforated with $\frac{1}{2}$ inch holes. All outside doors were flashed at the bottom with 24 gauge galvanized iron sheeting which was extended up on the corners of the doors and on the facings for a distance of 10 inches so that rats could not gnaw at the exposed edges. Holes found around plumbing and cables and other breaks in brick or stone construction were closed with scrap brick and mortar. A wall of corrugated galvanized iron



FIGURE 4—Another view of the building in FIGURE 3. A trench 2 feet deep has been dug around the building and a wall of galvanized iron roofing installed 2 feet below the ground level and several inches above. The top edge has been firmly nailed to the building.

(metal roofing) was installed in a trench to a depth of 2 feet around wooden buildings and extended several inches up the side with the top edges of the metal firmly nailed to the buildings. The average cost of material for rat-proofing a building was \$7.56, with a maximum cost for any one building of \$47.70 and a minimum cost of \$2.00.

After the building had been made rat-proof from without, the basement was gassed with cyanide A dust and the remainder of the building with cyanide G fumigant. In order to make sure that all rats in the building were destroyed, poison bait and traps were placed in it for several weeks after gas had been used. Where rat-proofing was not done, buildings were first cleaned of refuse and trash, materials were stacked to prevent harborage, and then poisoning and trapping were carried on until it was evident that no rats remained.

Trapping was done exclusively with steel snap-traps, since these traps usually snare the rat without killing it.

By use of this trap, fleas which do not usually leave live rats are prevented from migrating, and can be destroyed with the rat. The trigger of each trap was brushed with a small amount of anise oil which, besides destroying the human odor, attracted the rats. The traps were set with the jaws parallel to the runs, which usually were found along the walls of buildings, fences, etc. Rats caught in the traps were killed, placed in flea-proof bags, and incinerated in order that fleas present on them would be destroyed.

The bait was mixed in proportions of 1 part red squill, 2 parts cereal, and 8 parts meat. Oatmeal or cornmeal was used as the cereal constituent, and cheap ground beef or canned salmon as the meat portion. Each individual bait, averaging about $\frac{1}{3}$ ounce, was placed in the center of $\frac{1}{4}$ of a cheap paper napkin which was then folded and twisted over the bait so that it was similar in appearance to a toy torpedo. At the time the baits were distributed, a cloth saturated with anise oil was tied

to the container in which the baits were carried. The baiter ran his fingers over this cloth before picking up the bait and placing it in the location desired. Fish bait was used in localities where cereal and grain had been freely accessible to rats, and beef bait was used where fish and poultry had been freely accessible to them. The poisoned bait was prepared at a cost of approximately 12 cents per lb. or $\frac{1}{4}$ cent per bait.

During the period November 9, 1939, to February 1, 1940, 3,268 rats were recovered and about 14,000 were believed to have been killed by poisoned bait. Of the rats recovered, 90 per cent were *Rattus norvegicus*, 8 per cent *Rattus alexandrinus*, and 2 per cent *Rattus rattus*.

POSSIBLE SPREAD FROM NASHVILLE

Among other cases of endemic typhus fever reported during 1939, 12 cases were reported in the small City of Lebanon, 30 miles east of Nashville on the Tennessee Central Railroad and also on a main arterial highway. This railroad has freight yards in Area 2 in the City of Nashville. These cases in all probability represent an extension of the infection from Nashville. During the autumn of 1939, 3 cases were reported from the City of Jackson, 142 miles west, and 3 from the City of Chattanooga, 138 miles southeast of Nashville. The cases in Jackson probably represent an extension of the infection either from Nashville or from Alabama, while those in Chattanooga probably represent a spread from Georgia.

DISCUSSION

The control measures instituted in Nashville were emergency measures aimed at preventing the spread of the infection to other parts of and outside the city. It is probable that infected rats had already moved beyond the

known focal areas. The extension of rat control and rat-proofing to all parts of the city is indicated and is being planned.

The method of rat-proofing which has been briefly described in this report is only intended to prevent the entrance of rats into buildings. It requires constant maintenance in conjunction with poisoning and trapping of any rats which gain entrance. Such a program of rat-proofing is recommended for use in buildings already constructed, the procedure being attractive to merchants because of the low cost involved. On the other hand, complete and permanent rat-proofing of buildings already constructed, including the elimination of all rat entrances and all possible nesting places within the building, is not attractive because of its high cost.

The passage and the enforcement of a rat-proofing ordinance by city governments generally are advisable. Such an ordinance should require the rat-proofing of all buildings to be constructed, repaired, or remodeled, and should require maintenance after construction. A model ordinance has been prepared by the U. S. Public Health Service⁸ covering all essential points. An ordinance has been drawn, based on this model ordinance, which is to be submitted to the City Council of Nashville for consideration. The proper collection and disposal of garbage, removal of litter, abolishment of dump heaps, insanitary privies and cesspools, and establishment of general cleanliness, including even the periodic cutting of weeds in open lots, also play an important part in rat control.

It is evident that endemic typhus fever is spreading into the interior of the United States from the original foci of infection on the south Atlantic and Gulf coasts. The infection already has spread as far north as Tennessee, the first known focus in this state being

found in Nashville in 1935. Meleney⁹ has outlined the extent of the disease in the southern United States as of 1939. State and local health officials in general, and those of the southern states in particular, must seriously consider active programs of rat control and rat-proofing in all villages, towns, and cities. The institution of this program should not be delayed until after foci of the disease have been established but should be started immediately. Specially trained personnel are essential if a program is to be successful. Such a program will not only control but will also provide a barrier against endemic typhus fever and other rat-borne diseases such as bubonic plague, and will more than pay for itself by decreasing the great economic loss due to rats.

SUMMARY

1. The first case of typhus fever to be officially reported in Tennessee occurred in 1926. By January 1, 1940, 168 cases had been reported.

2. The first known cases of typhus fever in Nashville were reported in 1935. A focus probably was established first in the southern part of the city in a feed mill located on two railroads a short distance from where they enter the city. By January 1, 1939, 31 cases had been reported.

3. An outbreak* occurred in Nashville in 1939. Seventy-five cases were reported, of which 60 were among white persons and 15 among colored. The case fatality rate was 2.7 per cent.

* Since this report was prepared early in 1940, it is interesting to note the subsequent incidence of typhus fever in the city. Eighteen cases were reported during the year. During the first two months of 1940 and prior to the time control measures had been completed in Area 2, 3 cases occurred among employees of a freight depot in that area. During the summer and autumn of 1940, 4 cases were reported from the immediate section around Area 1, and 7 cases from the immediate territory around

4. One or the other of three foci in the city was determined as the probable source of infection for 70 cases.

5. Trapping, poisoning, removal of garbage and trash, and rat-proofing were done in each area, starting several blocks in radius from each focus and working inward toward the midpoint.

6. Foci of the disease have been established in three other cities in the state, representing a spread either from Nashville or an extension of the infection from Alabama and Georgia.

7. Since the disease is spreading inland from the original foci in the southeastern states, state and local health officials in general, and those of the southern states in particular, must consider seriously active programs of rat control.

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Area 2. Four cases were reported among employees of a dog food factory located about seven blocks from the center of Area 2. This represents a new focus of infection. In addition, 4 cases in residents of Davidson County may have obtained the infection within the immediate vicinity of Area 2. The location of probable sources of infection in 1940 indicates that it will be necessary to extend the control measures over a large area if the disease is to be held under control in Nashville.

Application of Epidemiological Method to a Study of the Distribution of Medical Care*

JOHN J. BOURKE, M.D., M.P.H., F.A.P.H.A., AND
MARGARET BULLOWA, M.S.P.H.

*Research Director, and Statistician, New York State Legislative Commission to
Formulate a Long Range Health Program, Albany, N. Y.*

IT is generally conceded that adequate medical care is an essential element in maintaining the health of the public even though controversy may still exist concerning the place of medical care in public health administration. If medical care is not secured the reservoir for illness is increased. Disturbed economic stability brings into play the adverse factors of inadequacy of nutrition, housing, and clothing. We have reached a point in modern medical and public health practice where closer fusion of preventive and curative services to each individual can result in increasing returns in community health. Therefore, knowledge of factors affecting the distribution of medical care is essential.

The purpose of this paper is to demonstrate that both the individual and community aspects of medical care may be profitably studied by the methods of epidemiologists. The broadening viewpoint in epidemiology, as expressed by Major Greenwood, "came to mean the study of disease, any disease, as a mass phenomenon. It differs from the study

of disease by the clinician primarily in respect of the unit of investigation."¹

The study of communicable disease deals with the characteristics of each disease and the population affected. Applying the epidemiological method to a study of the distribution of medical care, comparable factors are involved. Among the variables which call for study are types of illness and their amenability to medical treatment, the ability of the patient to recognize the need for medical attention and willingness to utilize medical care facilities when geographically and economically accessible. Characteristics of a population which are significant in studying medical care problems deal with population density, income level and sources, and extent of welfare assistance. A study of these factors, treated as mass phenomena, assumes more significance than a series of case histories.

The present-day interest in the organization and distribution of medical services emphasizes the need for reliable data. A knowledge of the epidemiology of medical care is vital to successful operation of proposed voluntary health insurance, group practice, or prepayment medical and hospital care plans.

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

As social legislation increases government responsibility for the provision of medical care, this type of data is also essential to legislators and public administrators.

The present study was planned to gain an insight into problems of medical care for that portion of the population least able to provide adequate medical care for itself. It was hoped that the findings from this study would aid in the planning of a long range health program for New York State.

Since serious illness best brings the factors involved in obtaining medical care to the fore, it was decided to study the experiences of a group of individuals known to have been seriously ill. Inasmuch as the more severe phases of illness are those most likely to reach the hospital, the use of hospital records provides a source whereby it is possible to locate individuals who are known to have been seriously ill and for whom medical diagnoses have been recorded by persons competent to make medical judgments. The hospital experience provides a focus in the medical history of an individual from which it is possible to trace factors relating to the availability and adequacy of medical service together with the economic problems concerned.

The problem of the distribution of medical care has both medical and economic aspects. This is true not only from the point of view of the individual patient and his family, but also from that of the medical profession and public agencies. An opportunity to study the correlation between medical and economic data for a significant number of cases was expected to throw light on the problems in the distribution of medical care.

Patients cared for in hospital wards were selected because they were most likely to demonstrate the economic problems associated with serious illness. In addition, ward patients are of great

community concern because they come from an economic group in which the incidence of illness is highest, health information most frequently lacking, and serious illness the greatest economic burden.

Communities vary in degree of organization for health and welfare needs and the adequacy and accessibility of medical services. In order to obtain conditions representative of the whole state, sample communities showing varying degrees of health and welfare organization and policy were selected for study.

Eleven general hospitals in ten different counties in New York State were selected as a source of material for study. (A preliminary analysis of their data has appeared in the 1940 *Report of the New York State Legislative Commission to Formulate a Long Range Health Program*.²) The counties ranged from rural to metropolitan and varied in degree of public health and public welfare organization. Medical care and public health facilities and policies were charted for these counties (see Table 1). Both voluntarily and publicly supported hospitals were included in the study. The approximate size of the sample to be selected from each hospital was determined on the basis of the population of the county and annual admissions to the hospital selected.

A nurse field worker visited each locality and copied hospital and welfare department data for each patient onto a schedule. This information included age, sex, color, civil status, occupation, length of stay in hospital, whether surgery was performed, condition on discharge, and agency responsible for hospital expense, including method of payment when patient was responsible.

Ward cases were taken in consecutive order of discharge, beginning with the most recently discharged case at the time of the field worker's visit. Only accident emergencies, psychiatric cases,

TABLE 1

Characteristics of New York State Counties and Hospitals Studied

Type of County	Pop. per Sq. Mile	Beds per 1,000 Pop. ¹	Hosp. Con- trol	Staff Organi- zation	Bed Capac- ity ²	Aver. Daily Census ³	Hosp. O.P.D.	Welfare Policy ⁴
A—Rural	38.8	2.4	Vol.	Semi- Closed	68	37	No	Med.+Hosp.
G—Rural-Industrial	43.9	1.8	Vol.	Open	31	29	No	Med.+Hosp.
B—Rural	47.9	4.7	State- Aid	Closed	112	85	Yes	Hosp. Only
H—Rural with County Health Dept.	63.0	4.7	Vol.	Closed	133	95	No	Hosp. Only
F—Rural with Small City	83.6	12.7	Vol.	Closed	97	48	No	Med.+Hosp.
E—Rural with Small City	118.3	2.2	City	Closed	100	75	No	City Hosp. ⁵
J ² —Suburban	156.3	6.0	Vol.	Closed	61	39	Yes	Hosp. Only
J ¹ —Suburban			Vol.	Closed	90	69	Yes	Hosp. Only
I—Suburban with County Health and Welfare Depts.	175.1	4.1	Vol.	Closed	101	43	No	Med.+Hosp.
D—Urban	402.2	4.5	Vol.	Closed	593	540	Yes	Hosp. Only
C—Urban	737.3	3.9	City	Closed	1,025	862	Yes	City Hosp. ⁶

¹ Beds in AMA approved general hospitals only² Excluding bassinets³ AMA 1939 census⁴ For reimbursement on charges for hospitalized cases⁵ City operates hospital; welfare cases cared for in hospital by salaried physicians.⁶ Receives support from County Welfare Department—salaried staff physicians.

and uncompleted records were omitted from the series. A total of 2,100 schedules were filled out. The number of records copied varied from 80 from a 30 bed rural hospital, to 600 from a 1,000 bed hospital in a large city. This method of selecting cases did not provide seasonal uniformity from hospital to hospital.

With these data obtained from existing records, public health nurse investigators were sent into the field to interview the patients or responsible members of their families. The average interview consumed 40 minutes.

The nurse investigators first asked for a statement in the patient's own words of symptoms and date of onset of the illness which resulted in hospitalization. In order to secure a background concerning medical care practices prior to his illness he was asked whether he had a regular family physician and whether he had ever had a complete physical

examination. The content of this examination, whether it was made in connection with life insurance, whether by a private physician, and where it took place, were called for. The patient was asked to specify the date and place of first medical attention for the illness which brought him to the hospital. When a delay was reported the patient was asked the reason.

Resort to self-medication was elicited by a question as to whether and for how long the patient doctored himself for the illness under study before securing the services of a physician. When self-medication was acknowledged, the name of the remedy used and the source of recommendation for its use were called for.

Medical care for this illness was discussed from the medical and economic points of view. The patient was asked whether and for how long he had been under the care of a private physician

prior to this hospital admission; how many office and home visits had been made; whether the physician had called a consultant; whether the patient had consulted more than one physician, and how many of his physicians had been specialists. He was also asked to specify the content of any physical examination made by a private physician and the laboratory tests performed during the pre-hospital period of this illness. In addition, he was asked how the charges for physicians' services had been met. When the pre-hospital care included clinic services, the patient was asked to identify the clinic, and the referring agency; and state how long he had been under clinic care and how many visits he had made.

Concerning the hospitalization under study, the patient was asked who referred him to the hospital, dates of application and admission to the hospital, whether he had been admitted as an emergency case, and whether he felt there had been any delay in gaining admission. The patient was questioned concerning the person or agency responsible for meeting the expense of his hospitalization, and whether he had paid for physician's services in the hos-

pital. Hospital policy regarding the medical care of ward patients and local welfare department policies differ widely. Therefore, statements on these points by individual patients may simply reflect local practices.

The follow-up services after hospital discharge were recorded in terms of number of visits to physicians or clinics and by nursing agencies.

The economic background of the patient and his family was reviewed from the standpoint of annual cash income, and relief history extending back to 1934.

The primary emphasis in the study was on the history of each patient's disease in terms not only of medical sequence but also of individual and family welfare. No attempt was made to evaluate the quality of hospital medical care. The illness which led to this hospitalization was considered the focal point of the study.

Data for all patients were secured from the hospital and welfare records by a single graduate nurse with special training in hospital and welfare administration. Patients' interviews were completed by five graduate public health nurses, under the supervision and direc-

TABLE 2

1,607 Cases Considered by Each Type of Clinical Course by Study Area

Type of County	All Cases	Acute Attack with Previous History					Tonsillectomy ¹
		Recent Sudden Onset	History Same Illness	Long-Standing Continuous Condition	Obstetrical	Per cent of Total	
	Number	Per cent of Total	Per cent of Total	Per cent of Total	Per cent of Total	Per cent of Total	Per cent of Total
All Counties	1,607	31.6	12.0	30.5	16.7		9.2
A—Rural	89	42.7	22.5	14.6	16.8		3.4
G—Rural-Industrial	60	36.7	13.3	15.0	21.7		13.3
B—Rural	121	41.4	14.9	23.1	19.8		0.8
H—Rural with County Health Dept.	110	24.5	13.6	11.0	20.9		30.0
F—Rural with Small City	104	26.0	17.3	30.8	19.2		6.7
E—Rural with Small City	113	25.7	15.9	27.4	19.5		11.5
J ² —Suburban	85	9.1	9.1	27.3	17.0		37.5
J—Suburban	126	32.5	15.9	27.8	18.2		5.6
I—Suburban with County Health and Welfare Depts.	139	20.1	12.2	17.3	28.1		22.3
D—Urban	105	31.4	9.5	36.2	18.1		4.8
C—Urban	552	37.1	7.4	44.2	10.0		1.3

¹ Includes 2 cases admitted for tonsillectomy but not operated

TABLE 3

1,607 Cases Considered by Each Type of Clinical Course with Per cent Surgery by Study Area

Type of County	All Cases	Recent Sudden Onset	Acute Attack with Previous History Same Illness	Long-Standing Continuous Condition	Obstetrical
	Per cent Surgical	Per cent Surgical	Per cent Surgical	Per cent Surgical	Per cent Surgical
All Counties	43.7	38.4	61.6	48.2	2.3
A—Rural	56.2	60.5	85.0	53.9	...
G—Rural-Industrial	60.0	68.2	100.0	55.5	...
B—Rural	26.4	22.0	38.9	42.8	4.2
H—Rural with County Health Department	55.5	40.7	73.3	50.0	...
F—Rural with Small City	68.3	77.8	88.9	84.4	...
E—Rural with Small City	54.0	65.5	55.5	58.1	4.5
J ² —Suburban	62.5	37.5	75.0	62.5	...
J ¹ —Suburban	40.5	46.3	60.0	37.1	...
I—Suburban with County Health and Welfare Departments	48.2	57.1	70.6	33.3	...
D—Urbao	31.4	24.2	30.0	42.1	5.3
C—Urbao	33.5	23.9	41.5	44.7	5.5

TABLE 4

Per cent of Cases, by Family Economic Groups and Areas¹

	All Cases (Except T & A and Not Reported)	Any Form of Relief During Past Year	No Income from Relief During Past Year	
			Family Cash Income Under \$750	Family Cash Income \$750 or Over
		Per cent of All Cases	Per cent of All Cases	Per cent of All Cases
All Counties	1,269	49.0	15.3	35.7
A—Rural	74	37.8	25.7	36.5
G—Rural-Industrial	48	27.1	16.7	56.2
B—Rural	113	31.0	30.1	38.9
H—Rural with County Health Department	74	55.4	28.4	16.2
F—Rural with Small City	88	19.3	14.8	65.9
E—Rural with Small City	91	38.5	13.2	48.3
J ² —Suburban	54	44.4	11.1	44.5
J ¹ —Suburban	114	28.1	24.5	47.4
I—Suburban with County Health and Welfare Departments	96	19.8	16.7	63.5
D—Urban	93	52.7	16.1	31.2
C—Urban	424	77.6	5.2	17.2

¹ Not included are 190 cases for which source or amount of income was not reported

TABLE 5

Per cent of Cases Delayed in Securing Medical Care by Clinical Course by Stated Reason

Clinical Course	Number of Cases	Per cent Delayed All Reasons	Did Not Realize Necessity	Per cent Delayed Economic Reason	Self-Neglect ¹	Other Reasons
All Cases (Except T & A)	1,459	54.4	50.6	29.1	11.5	8.8
Recent Sudden Onset	508	49.6	61.9	23.0	5.6	9.5
Acute Recurrent	193	44.6	40.7	34.9	16.3	8.1
Long-Standing Continuous Condition	490	55.9	44.9	39.0	8.8	7.3
Obstetrical	268	67.5	48.1	19.9	21.5	10.5

¹ Includes 4 cases in which patient stated "did not realize necessity" as a reason combined with "self-neglect."

tion of a physician. When it was known that a private physician had referred a patient to the hospital, the physician was advised by letter of the scope, purpose, and methods of the study, and informed of the names of his patients to be visited by the field nurses. Excellent coöperation was received from all the hospitals and their medical boards. Diagnosis of the illness responsible for each hospitalization was coded by a physician, and all problems relating to clinical course were subjected to medical review. Before completing a final statistical analysis, each case was reviewed and edited as a unit. Punch card tabulation was utilized.

The following significant observations were presented for 1,607 cases*:

The illnesses which brought these patients to the hospital have been classified into three broad categories according to clinical type. In addition, obstetrical and tonsillectomy cases which present certain special characteristics have been analyzed as separate groups. Table 2 shows the proportion of cases in each of these groups in the entire study and by individual hospitals. It is notable that the rural hospitals cared for a high proportion of cases with recent onsets and for acute attacks of recurrent conditions, indicating their greater use for emergency situations as compared to the hospitals in more urban communities. Table 3 shows the surgical rate for each type of case for each hospital in the study. In general, the surgical rates were considerably lower for the hospitals of large urban centers.

An index of the economic status of the patients considered in this study may be gained from an analysis according to whether or not any form of public assistance was received *within the year preceding interview*. Among all cases

(except tonsillectomies and those for which data were not supplied), it may be seen from Table 4 that nearly one-half had received relief. Those who received no relief during this period have been analyzed according to whether the family annual cash income was under or over \$750. The breakdown of these data by hospitals shows a high degree of variation from community to community, and an unusually high proportion of relief recipients in the large urban centers and also in one rural county. Thus, it may be seen that the blanket figure of 49 per cent relief recipients conceals a variety of local situations. However, an analysis by economic status, based on relief support *at the time of hospitalization*, showed a considerably lower proportion in the relief group. This suggests that a large group of the ward population is made up of families on the economic fringe between relief and self-support. The general economic level of a community also affects the proportion of the ward population on relief. The type of control of the hospital under study, as well as the existence of government supported hospitals in the vicinity, is another factor on which economic distribution of ward population depends.

Reasons stated by the patients for delay in securing medical care for the conditions which necessitated their hospitalization have been analyzed according to clinical course in Table 5. Fifty-four per cent of all cases (tonsillectomies excepted) reported delays. The highest proportion of delays, 67.5 per cent, was reported by obstetrical patients. This high figure is the result of the application of strict criteria in defining delay in obstetrical cases. Any patient not under medical supervision by the end of the third month of pregnancy was considered a delayed case. The predominant reason brought forward in all types of cases was failure to realize the necessity for medical atten-

* The nurses were able to complete 1,784 home interviews covering 85 per cent of the 2,099 ward patients selected. One hundred and seventy-seven cases are omitted from this analysis because they were considered unsuitable for statistical handling.

TABLE 6

Per cent of Cases Seen by Clinics and by Physicians in Pre-Hospital Period and Per cent of Cases for Whom Public Welfare Agencies Paid Physicians' Fees

Type of County	All Cases (Except T & A) ¹	Per cent Seen by Clinic	Seen by Physician	
			per cent	M.D. Per cent Paid by Wel- fare Agency ²
All Counties	1,459	24.5	80.8	29.2
A—Rural	86	...	100.0	23.3
G—Rural-Industrial	52	...	100.0	28.8
B—Rural	120	5.0	95.0	29.8
H—Rural with County Health Dept.	77	18.2	80.5	40.3
F—Rural with Small City	97	2.1	99.0	15.6
E—Rural with Small City	100	8.0	98.0	30.6
J ² —Suburban	55	25.5	83.6	28.3
J ¹ —Suburban	119	8.4	89.1	17.0
I—Suburban with County Health and Welfare Departments	108	0.9	97.2	21.9
D—Urban	100	55.0	57.0	17.5
C—Urban	545	45.3	65.5	39.5

¹ Includes 142 cases seen by both physician and clinic and 65 cases seen first at time of hospitalization

² Includes public physicians paid by welfare departments

tion. It is noteworthy that the initial attacks of acute conditions accounted for the highest proportion of these, while recurrent attacks and long-standing continuous conditions appear to have educated the patient to some extent to the necessity for medical attention. In the latter types of case, the economic factor played a more prominent rôle.

Medical care received in the pre-hospital period for the illness which necessitated hospitalization was studied

as shown in Table 6—24.5 per cent of the cases reported care by clinics. An analysis of clinic utilization according to economic status of the ward patients showed that the existence of clinic facilities rather than family income conditioned clinic attendance.

The proportion of patients cared for by private physicians is shown in Table 6. It will be noted that in many instances patients must have utilized both clinics and physicians' services. The proportion of physicians' services paid

TABLE 7

Per cent of Cases Seen by Physicians in Pre-Hospital Period, by Family Economic Groups and Areas¹

Type of County	Any Form of Relief During Past Year	No Income from Relief During Past Year		
		Family Cash Income Under \$750		Family Cash Income \$750 or Over
		Seen by Physician		
	Per cent	Per cent	Per cent	Per cent
All Counties	71.2	85.6	90.5	
A—Rural	100.0	100.0	100.0	
G—Rural-Industrial	100.0	100.0	100.0	
B—Rural	100.0	100.0	100.0	
H—Rural with County Health Department	97.1	94.1	95.5	
F—Rural with Small City	82.9	66.7	100.0	
E—Rural with Small City	100.0	100.0	100.0	
J ² —Suburban	97.1	100.0	100.0	
J ¹ —Suburban	87.5	83.3	79.2	
I—Suburban with County Health and Welfare Depts.	90.6	78.6	92.7	
D—Urban	100.0	100.0	96.7	
C—Urban	55.1	66.7	58.6	
	56.8	68.2	75.3	

¹ Not included are 190 cases for which source or amount of income was not reported

TABLE 8

Per cent of Cases, by Family Economic Groups and Areas, with Per cent of Those Seen by Physicians in Pre-Hospital Period and Paid for by Public Welfare Agencies¹

Type of County	Any Form of Relief During Past Year	No Income from Relief During Past Year	
	Seen by Physician	Family Cash Income Under \$750	Family Cash Income \$750 or Over
		Seen by Physician	
		Per cent Welfare Paid Physician ²	Per cent Welfare Paid Physician ²
All Counties	62.8	10.2	7.8
A—Rural	64.3	5.3	...
G—Rural-Industrial	76.9	25.0	7.4
B—Rural	64.7	12.5	19.0
H—Rural with County Health Department	61.8	7.1	25.0
F—Rural with Small City	64.7	7.7	3.4
E—Rural with Small City	85.3	...	2.3
J ² —Suburban	57.1	...	5.3
J ¹ —Suburban	51.7	...	6.0
I—Suburban with County Health and Welfare Depts.	94.7	18.8	1.7
D—Urban	33.3	10.0	...
C—Urban	60.4	26.7	20.0

¹ Not included are 190 cases for which source or amount of income was not reported

² Includes public physicians paid by welfare departments

for by welfare agencies is also shown and its variability indicates differences in local welfare policy. Tables 7 and 8 analyze care by and welfare payment of physicians by economic status of patients. It may be seen that the variation from community to community is not entirely dependent upon the economic distribution of the ward patient sample but is also determined by local welfare policies.

Nearly 50 per cent of the hospitalizations studied were paid for from Welfare Department funds as shown in Table 9. The two densely populated urban areas contributed the highest proportion of welfare paid cases. It should be noted that urban hospital D is a municipal hospital so that all hospitalizations not paid for by patients were considered welfare responsibilities. An attempt was made to find out whether patients had

TABLE 9

Per cent of Hospitalization Paid for by Public Welfare Agencies and Per cent of Patients Responsible for the Payment of Physicians' Services in Hospital, by Study Areas

Type of County	All Cases	Per cent Cases Hosp. Paid by Welf. Dept. ¹	Per cent Cases Responsible for M.D. Fees in Hosp.
All Counties	1,607	48.6	33.7
A—Rural	89	32.6	62.9
G—Rural-Industrial	60	30.0	70.0
B—Rural	121	54.5	46.3
H—Rural with County Health Department	110	50.0	1.8
F—Rural with Small City	104	17.3	79.8
E—Rural with Small City	113	29.2	70.8
J ² —Suburban	88	30.7	33.0
J ¹ —Suburban	126	26.2	66.7
I—Suburban with County Health and Welfare Depts.	139	27.3	68.3
D—Urban	105	82.9	5.7
C—Urban	552	68.3	1.4

¹ Includes 31 cases in which patient shared hospital expense with welfare department

been responsible for payment for physicians' ward services in the hospital, as shown in Table 9. Hospital staff organization is revealed in the findings.

Evidence of the burden which many of the patients in the lower and intermediate income groups experience in attempting to pay medical and hospital bills was brought out by interview but is not shown by statistical analysis. A number of patients, especially in rural areas, stated that they were still paying small amounts toward the medical expense of previous illnesses at the time they were taken sick with the illness under study.

SUMMARY

A few of the factors involved in the distribution of medical care have been statistically analyzed and presented. This new application of epidemiological method shows the complexity of the factors requiring analysis in order to arrive at valid conclusions concerning the distribution of medical care and the dangers inherent in reaching conclusions based on too superficial an approach to the problem.

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Human Equine Encephalomyelitis in Kern County, California 1938, 1939, and 1940*

WILLIAM C. BUSS, M.D., C.P.H., AND BEATRICE F. HOWITT
*Kern County Health Department, Bakersfield, Calif.; and the George Williams
Hooper Foundation, University of California Medical Center,
San Francisco, Calif.*

IN addition to the known neurotropic virus diseases that have been responsible for much human and animal sickness, medical science has recently added equine encephalomyelitis to those affecting man. In 1930, Meyer, Haring, and Howitt¹ first isolated a virus from the brain tissue of infected horses in California. Meyer² had suspected the occurrence of human encephalomyelitis in 1932, when the disease was reported in three men working with horses having encephalomyelitis. No virus, however, was recovered. In 1938 Fothergill, Dingle, Farber, and Connerly³ reported obtaining the eastern strain of the equine virus from human cases in Massachusetts, while in the same year the relationship of the western strain to man was first established by Howitt⁴ in California. Meyer⁵ had suggested that, in the lower San Joaquin Valley, cases of encephalitis had been inaccurately reported as poliomyelitis or had been missed. Subsequently, in so far as could be determined by serum neutralization tests as reported by Howitt⁶ in 1939 and by diagnostic information from other sources, a different viewpoint was obtained concerning neurotropic virus

diseases in Kern County, Calif. Although poliomyelitis predominated, an unexpectedly high proportion of the cases proved to be of the equine encephalomyelitic type, and a small number of the St. Louis type of encephalitis, as demonstrated by means of the serum neutralization tests. A few remained not specifically diagnosed. Thus it was shown that more than one variety of neurotropic virus disease had been prevalent in Kern County.

Seventy-one patients in 1938, 160 in 1939, and 85 in 1940 were admitted to the Kern County General Hospital with a tentative diagnosis of neurotropic virus disease. A few cases were quarantined at home during each of the three years. On the basis of the neutralization tests, the epidemiological histories and the clinical and laboratory findings, 116 cases were segregated as equine encephalomyelitis. There were 22 cases in 1938, 46 in 1939, and 48 in 1940. The recovery of the western equine virus from the brains of 2 patients confirmed the presence of human cases in Kern County.

The neutralization tests employed for the differential diagnosis of the cases were performed according to methods previously described.⁶ The strain of western equine virus isolated in Cali-

* Aided by a grant from the National Foundation for Infantile Paralysis, Inc.

fornia in 1938⁴ was used throughout the studies, while the St. Louis virus was one originally sent by Dr. L. T. Webster of the Rockefeller Institute. Whenever material could be obtained, 10 per cent suspensions of brain or cord from autopsy cases were inoculated into mice, guinea pigs, and a monkey. Upon recovery of a virus from one or all of these animals, further serological and immunological tests were made to determine the type.

The following report deals with a neurotropic virus study in Kern County, Calif., conducted by the staff members of the Kern County General Hospital and the Kern County Department of Health in the years of 1938, 1939, and 1940, in collaboration with Miss Howitt.

EPIDEMIOLOGY

Unsolved problems concerning the epidemiology of equine encephalomyelitis are numerous, even though further knowledge of the disease has accumulated rapidly. In Kern County, the summer and fall occurrence parallels the seasonal incidence shown in other sections of the country. The reoccurrence of cases in successive years shows a spotty distribution in rural areas. In the farming districts the horse population has been repeatedly exposed to the virus; there are irrigation ditches or other breeding places for mosquitoes that might be incriminated as insect vectors, and there are the human cases. There was no epidemiological evidence to indicate that the virus of equine encephalomyelitis was carried through milk, water, or food. It seemed quite unlikely that secondary cases occurred by direct or indirect contact. For these reasons and because of the limitation of the disease to the warm season of the year, the possibility of its spread by an insect vector, particularly the mosquito, was seriously considered. Evidence to corroborate this theory can be seen in the following typical histories

taken from the group of human cases of encephalomyelitis of 1939.

Case 13—S.C.L., male, 5 months of age, was admitted to the Kern County General Hospital on July 15, 1939, because of irritability, stiffness of the neck, convulsions, and fever. Onset of illness was July 8, 1939. Physical findings were normal except for stiff neck, bulging anterior fontanel, and spasticity of the extremities. X-ray of the chest was negative. Spinal fluid showed increased pressure, ground glass appearance, 115 cells, 56 per cent polymorphonuclears and 44 per cent lymphocytes, globulin 4+. The child made a complete recovery. The neutralization test was positive for the western equine virus. This child was from the Buttonwillow district where there had been horses sick with equine encephalomyelitis within a half mile of the home. The child was covered with old and new insect bites which the parents stated were from mosquitoes.

Case 19—G.G., 7 weeks old Mexican female, a neighbor of Case 13, became ill July 28, 1939, and was admitted to the Kern County General Hospital on August 1, 1939, because of chills, fever, convulsions, and neck stiffness. These findings were noted in the hospital stay as well as cyanosis, bulging fontanels, irritability, and difficulty in taking food. Spinal fluid examination on August 5, showed 36 cells, 10 per cent polymorphonuclears and 90 per cent lymphocytes, with 4+ globulin. The child died on August 9, 1939. The gross post-mortem findings were negative. Microscopic pathology was consistent with encephalomyelitis as the anatomical diagnosis. The serum neutralization test was also positive for equine encephalomyelitis. The child had been covered with old and new mosquito bites.

Case 26—C.F., a white male, age 5½ weeks, became ill on August 14, 1939, and was admitted to the Kern County General Hospital on August 19, 1939, because of fever, vomiting, convulsions, neck stiffness, and head cold. Physical findings were normal except for stiffness of the neck, spasticity of the extremities, and slight bulging of the fontanels. Spinal fluid examination of August 20, 1939, showed increased pressure, ground glass appearance, 938 cells, 50 per cent polymorphonuclears and 50 per cent lymphocytes, with 4+ globulin. The serum neutralization test was positive for equine encephalomyelitis. This child had been bitten frequently by mosquitoes, and made a complete recovery.

Case 30—R.B., white male, 30 years of age, farm laborer, resident of McFarland for 2

years. Onset of illness was on August 23, 1939, at which time he had drowsiness, occipital headache, stiffness of the neck, chills, fever, loss of appetite, nausea and vomiting, and weakness of the left arm and left shoulder. Delirium and then unconsciousness began about August 29. A flat chest plate taken August 29, 1939, showed a bronchopneumonia of both upper lobes that cleared uneventfully. A complete recovery was made after 3 months of physical therapy treatment for the left arm and shoulder.

Prior to his illness this man had been working with a sick horse which the veterinarian diagnosed as having equine encephalomyelitis. Neutralization tests on the sera of the patient and the unvaccinated horse were positive for this disease. The man had been sleeping on a haystack near the horse and had been bitten repeatedly by mosquitoes.

CLINICAL PICTURE AND DIFFERENTIAL DIAGNOSIS

Acute anterior poliomyelitis and equine encephalomyelitis were given the most consideration among the neurotropic virus diseases seen in Kern County during 1938, 1939, and 1940. The diagnosis was clear-cut only in the instances of true paralytic poliomyelitis and in the age group under 1 year for the equine disease. The symptoms and clinical findings for human equine encephalomyelitis were particularly characteristic for cases under 1 year of age. Fever was common with temperatures to 107° F. in fatal and non-fatal cases; convulsions with muscle twitchings and spasms were observed; cyanosis, irritability, drowsiness, tremors, vomiting, muscle weakness, and a residual spastic type of paralysis were noteworthy. The spinal fluid findings usually showed

a ground glass appearance with increased globulin to 4+, slight increase in pressure, and white cell counts of 50 to 1,500. The differential white cell count seemed to vary considerably. In 1938, 52.6 per cent of the cases showed a predominance of lymphocytes over polymorphonuclears; in 1939, there were 78.5 per cent, while in 1940, the ratio had changed to 54.7 per cent of the cases with more lymphocytes to 45.3 per cent with more polymorphonuclears.

Because of the high incidence of tuberculosis and coccidioidomycosis in Kern County, Mantoux and coccidioidin skin tests were done routinely on every case in this series. Those having positive reactions to either skin test and considered as possibly having pulmonary forms of either of these diseases were given routine chest x-ray examinations.

The differential diagnosis of the neurotropic virus disease was frequently difficult, so that positive neutralization tests were most helpful. The atypical cases of equine encephalomyelitis and cases of non-paralytic poliomyelitis, particularly in the older age group, caused most concern in differentiation.

In the series of cases studied in Kern County in 1938, 1939, and 1940, the following diseases were considered in the differential diagnosis: the St. Louis encephalitis, lymphocytic chorio-meningitis, infectious mononucleosis, tubercular pachymeningitis associated with generalized tuberculosis of childhood, coccidioid meningitis, purulent types of meningitis, cerebral accident, luetic meningitis, postvaccinal encephalitis,

TABLE 1
Summary of Neutralization Tests for Equine Encephalomyelitis Among Neurotropic Virus Cases

Year	Cases of Encephalomyelitic Infection				Cases of Poliomyelitic Infection			
	No. of Cases	No. Tested	No. Positive	Per cent Positive	No. of Cases	No. Tested	No. Positive	Per cent Positive
1938	22	19	15	78.9	27	2	0	0
1939	46	46	42	91.3	73	65	5	7.6
1940	48	47	40	85.1	18	15	0	0
Total	116	112	97	86.6	118	82	5	6.0

encephalitis following measles, and one case of transverse myelitis.

Neutralization tests against the St. Louis encephalitic virus were done on all sera for the first 2 years but were discontinued during 1940. In 1938, 3

with frank cases of equine encephalomyelitis. Certain of these people had manifested symptoms suggestive of a mild attack of a neurotropic virus disease and were tabulated as "sick contacts" as shown in Tables 2 and 3.

TABLE 2

Summary of Neutralization Tests for Equine Encephalomyelitis on Sera of Contacts

Year	Sick Contacts (Mild Cases of Infection)			Well Contacts		
	No. Tested	No. Positive	Per cent Positive	No. Tested	No. Positive	Per cent Positive
1938	6	6	100	8	0	0
1939	17	7	41.1	14	2±	14.3
1940	18	16	88.9	60	3± 1+	6.7
					5± 1+	
Total	41	29	70.7	82		7.3

sera out of 19 (15.7 per cent) were positive to this virus alone, while in 1939 the numbers had dropped to 4 out of 46 (8.6 per cent). Four sera in 1938, and 5 in 1939 gave positive tests to both the St. Louis and the equine viruses.

Table 1 summarizes the results of the neutralization tests against the equine virus on sera of patients showing symptoms of either encephalitis or poliomyelitis during 1938, 1939, and 1940. Of 112 sera from cases diagnosed as encephalitis, 97 (86.6 per cent) were positive and of 82 sera from cases of poliomyelitis, only 5 (6 per cent) neutralized the equine virus.

During this 3 year period blood was obtained from different groups of so-called normal individuals, mainly relatives or friends who had been in contact

From a total of 82 well contacts, only 6 sera (7.3 per cent) showed evidence of neutralizing ability. Five of these were weakly positive and only 1 strongly positive. The latter serum came from a man of 29 years who was the father of an infant showing typical symptoms of the disease. The serum of the mother was negative. In fact, it was interesting that of 9 sets of both parents and 5 single parents tested for antibodies to the equine virus, only this man showed a positive test. Most of these parents had infants under 1 year of age who manifested typical symptoms of equine encephalomyelitis and gave positive serum neutralization tests. Their antibodies were therefore not acquired from the mothers.

The individuals listed as sick con-

TABLE 3

*Neutralization Tests Among Contacts to Cases of Equine Encephalomyelitis in 1940 According to Age **

	Under 1 Year		1-9 Years		10-19 Years		20 Years and Over	
	No. of People Tested	0 +	0 +		0 +		0 +	
Sick Contacts	18	0 0	2 (11.1%) 3 (16.6%)		0	7 (38.8%)	0	6 (33.3%)
Well Contacts	60	0 0	8 (13.3%) 1 (1.6%)	15 (25.0%)	1 (1.6%)	33 (55.0%)	2 (3.3%)	

* 0 = No neutralization
+ = Neutralized

tacts should probably have been placed with the group of real cases, since they all showed a mild or abortive attack of some illness, although few of them were hospitalized. However, because they were all either friends or relatives of someone having a more severe form of the equine disease, they were put in a separate group. During 1938, 1939, and 1940, sera from 41 such cases were tested for neutralizing ability and 29 (70.7 per cent) were positive to the virus of equine encephalomyelitis. The figures for 1940 are probably more reliable than for the other 2 years and also included the largest number of sera tested from apparently healthy individuals. That so many of the sick contacts were really mild cases of the same disease, affecting one or more other members in a family, is suggestive of a common source of infection or exposure to similar environmental conditions. That many of these people lived on farms, in labor camps, in box cars, or in small towns with an abundance of mosquitoes in common lends itself to this idea. Of one group of 9 children and adults tested from a migratory camp, 1 had the typical disease, 1 an abortive form with positive antibodies in the serum, while 1 other remained well but gave a weakly positive serum neutralization test. All 3 children were under 5 years of age.

Table 3 summarizes the age distribution for both the sick and well contacts of 1940 and shows the number having neutralizing antibodies for the equine virus in each period.

AGE AND SEX

Among the cases diagnosed as encephalitis in 1938, the range in age varied from 3 weeks to 41 years with 5 (22.7 per cent) of the group under 1 year of age and 50 per cent under 10 years. There were 10 females and 12 males (Table 4) with a mortality of 1 (4.5 per cent).

Among the poliomyelitic cases for the same year, the ages varied from 17½ months to 66 years, with none under 1 year. However, there were 12 cases (44 per cent) under 10 years of age. The youngest of 17½ months had negative neutralization tests for both the equine and the St. Louis viruses. There were 8 females, 19 males, and a mortality of 6 (22.2 per cent).

In 1939 the encephalitic cases ranged in age from 6 weeks to 62 years with 27 (58.6 per cent) under 10 years. Among the group of 8 cases (17.3 per cent) under 1 year of age, the diagnosis was substantiated both by clinical symptoms and the presence of neutralizing antibodies against the equine virus. There were 15 females and 31 males with a mortality of 3 (6.5 per cent). Two deaths occurred among those under 1 year of age.

For the poliomyelitic patients of 1939, the age varied from 10 months to 39 years, with 38 (52 per cent) of the 73 cases under 10 years. There were 27 females and 48 males and a mortality of 3 (4.1 per cent).

In 1940 the cases of encephalitis varied in age from 3 weeks to 63 years, with 16 (33.3 per cent) under 1 year. Twenty-nine (60.4 per cent) were in the group under 10 years. There were 15 females and 33 males with 1 (14.5 per cent) mortality. Only 18 cases of poliomyelitis occurred in 1940 (Table 4).

One may observe especially in Table 4, (1) that males predominated over females in both groups diagnosed either as poliomyelitis or encephalitis, with twice as many males in the years 1938 and 1939 for the latter disease, and (2) the largest percentage of cases diagnosed as encephalomyelitis in all 3 years occurred in the group under 10 years. There were over twice as many cases among the latter group as among adults 20 years or over. The

TABLE 4

*Age and Sex Distribution and Mortality Rate for Neurotropic Virus Cases **

Year	Disease	Sex		Total No. of Cases	Age Group				Mortality
		Male	Female		Under 1 Yr.	1-9 Yrs.	10-19 Yrs.	20 and Over	
1938	Polio.	19 (70.4%)	8 (29.6%)	27	—	12 (44.4%)	4 (14.8%)	11 (40.7%)	6 (22.2%)
	E. E.	12 (54.5%)	10 (45.5%)	22	5 (22.7%)	6 (27.2%)	4 (18.1%)	7 (31.8%)	1 (4.5%)
1939	Polio.	46 (63.0%)	27 (37.0%)	73	1 (1.3%)	37 (50.6%)	19 (26.0%)	16 (21.9%)	3 (4.1%)
	E. E.	31 (67.3%)	15 (32.7%)	46	8 (17.3%)	19 (41.3%)	7 (15.2%)	12 (26.0%)	3 (6.5%)
1940	Polio.	10 (55.5%)	8 (44.5%)	18	—	7 (38.8%)	4 (22.2%)	7 (38.8%)	2 (11.1%)
	E. E.	33 (69.1%)	15 (30.9%)	48	16 (33.3%)	13 (27.0%)	7 (14.5%)	12 (25.0%)	7 (14.5%)

* Polio = Poliomyelitis

E. E. = Equine encephalomyelitis

percentage is also high among infants under 1 year.

RACE AND GEOGRAPHICAL DISTRIBUTION

During the 3 years there was nothing significant about the racial distribution of the patients diagnosed as either poliomyelitis or encephalomyelitis. In 1939 there were 4 Negroes and 2 Mexicans among the cases of poliomyelitis and 4 Negroes, 1 Mexican, and 1 Japanese among those of encephalomyelitis. In 1940 there was 1 Negro.

The geographical distribution among the encephalitic groups occurred in definite endemic localities. In 1939 there were 6 cases in the Buttonwillow district. Three of them were 5 months

old or under, and all of them were under 5 years of age. This age group and the locality seem significant because of the presence of numerous mosquitoes and of many cases of encephalomyelitis reported among the horses. There were 11 human cases in the Wasco-Shafter area, 6 around Delano-McFarland Pond, and 3 in the Arvin-Lamont-Weedpatch districts. The remainder of the 46 patients were from rural localities outside of Bakersfield. In 1940 the same areas contributed most of the cases of human equine encephalomyelitis as shown in the map, in which a comparison is made of the distribution of human and equine cases.

The distribution of poliomyelitis was

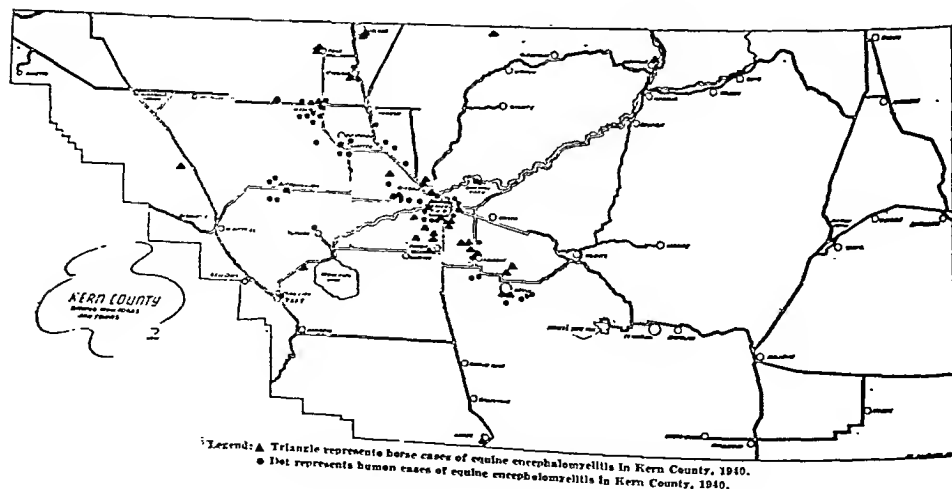
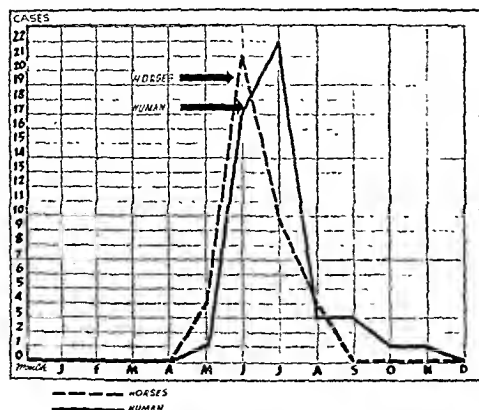


CHART I

Cases of Equine Encephalomyelitis in Kern County by month of onset in humans and in horses - 1940 -



noticeably in the more urban districts, with a few cases in the western end of the county.

Of most significance in the geographical distribution was the apparent absence of neurotropic virus diseases in the eastern end of the county. No encephalomyelitis was reported from the dry desert portions lacking in water, while all the known cases were found in the farming regions where water was plentiful. It is noteworthy that for each season the human cases of this disease have occurred in the same endemic localities where there have been both many mosquitoes and cases among the horses.

From the incomplete reports of Kern County veterinarians, approximately 40 cases of encephalomyelitis occurred among the horses in 1938, with fewer numbers in 1939, and again 40 in 1940. Chart 1 compares the incidence of human and equine disease for 1940. It has been exceedingly difficult to correlate specifically the human with equine cases in certain areas, although in the Wasco district in 1940 5 human cases were found within one to two miles of 2 acute cases among horses.

SEASONAL INCIDENCE

There is a definite seasonal incidence

of neurotropic virus diseases in Kern County. In 1938 the number of cases diagnosed as poliomyelitis reached a peak in August, as did also those of the human equine disease as shown in Chart 2. In 1939 there were reported 119 cases of neurotropic virus disease. Compared with the expected number of cases of poliomyelitis based on the mean of reported incidence in 1934-1938, there seemed to be a minor epidemic trend in 1939, but when the cases of poliomyelitis were separated from those of equine encephalomyelitis there was no evidence of an epidemic. The peak of encephalomyelitis in 1939 was in August, and that of poliomyelitis in November. This unexpectedly late incidence for the latter disease had been noted also for 1934 and 1935 when the summer heat was prolonged into the autumn months.

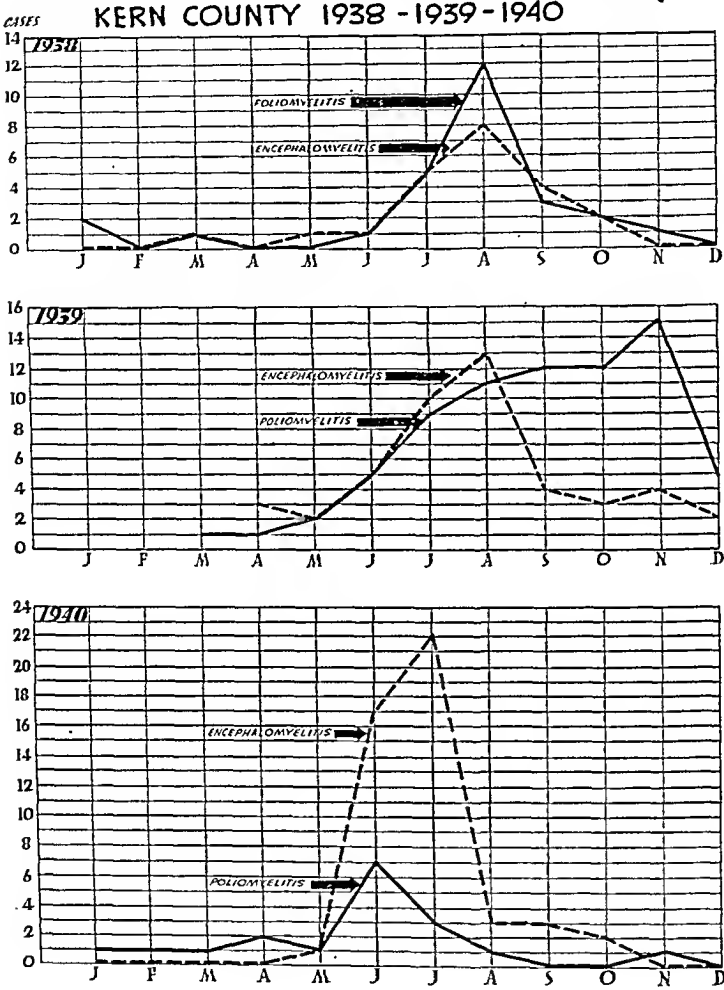
In 1940 the peak of the 48 human equine cases occurred in July, with 22 reported, followed by an abrupt decline. In each year the cases began to appear about May, increasing each month to a peak in July or August, and then falling off in September, but continuing with a few sporadic cases through October and November if the weather remained warm.

TREATMENT

Active treatment during the acute and following stages of the diseases was entirely nonspecific. For the severe convulsions a variety of sedatives were used, the most beneficial being chloral hydrate by rectal instillation and soluble phenobarbital given intravenously in doses of $1\frac{1}{2}$ to 2 grains. During 1938 sulfanilamide was given routinely, either parenterally or by gavage, during the period of illness. Later its use was limited to the first few days of illness until the possibility of bacterial meningitis had been excluded. During the comatose state parenteral fluids and gavage feedings were administered ac-

CHART II

★ Graphs comparing monthly incidence of Equine Encephalomyelitis and Poliomyelitis..... By month of onset.. ★



cording to necessity. Small transfusions and intramuscular blood were given routinely. A thorough muscle check was given in the physiotherapy department to those cases recovering at the end of 21 days, and treatment instituted when needed. Later spasticity or weakness of the extremities was treated by physiotherapy or application of casts. A periodic check followed discharge from the hospital in every case with apparent normal recovery.

DISCUSSION

It is evident that the disease of equine encephalomyelitis has been present among the human population of Kern County, Calif., for a number of years, as demonstrated by finding neutralizing substances in the sera of a few individuals with onset of symptoms in 1934 or 1935.⁶ While the results of this study are based largely upon the outcome of the neutralization tests, yet the presence of

the equine virus was proved in 1940 by recovery of this western strain from the brain material of 2 patients, one an infant of 7 months (F.J.M.), and the other an adult of 63 years (T.F.). The disease in the infant ran a typical course with fever, irritability, retraction of the head, lethargy, tremors and convulsions, the child becoming comatose and dying in 5 days after the onset. The adult showed headache, drowsiness, fever, coma, and death in 12 days after the onset of the disease. Suspensions of the brain stem of the 2 cases yielded the virus of western equine encephalomyelitis when inoculated into mice, guinea pigs, and monkeys.

Although the eastern virus of equine encephalomyelitis was the first to be reported in man,^{3, 7} it is apparent that the western strain has been infecting people over a larger area of the United States, as shown by reports based mainly on the results of serum neutralization tests or of clinical findings alone.⁸⁻¹² Fulton, however, has reported obtaining the virus from human brain and serum in Canada.¹³ That there is more of this human disease along the Pacific slope than surmised is evidenced by reports from the State of Washington where cases have been found in the Yakima Valley.¹⁴ In California the disease in man has become prevalent since 1937,⁶ a total of 43 cases having been reported in the literature so far; 3 by Meyer,² 32 by Howitt,⁶ 2 by Davis,¹⁵ and 6 by Cope and Maytum.¹⁶ These cases of human equine encephalomyelitis have occurred mainly in the two large central California valleys, with Kern County as

a principle focus at the lower end. Since 97 encephalitic cases in this county have given positive neutralization tests against the western equine virus during the past 3 years, the evidence is strongly suggestive of a permanent endemic area unless some control measures are instituted.

SUMMARY

It has been found that the western virus of equine encephalomyelitis is endemic among the human as well as the horse population of Kern County, Calif. Although cases of poliomyelitis predominated among those having neurotropic virus diseases, by means of the serum neutralization test it has been shown that for the years 1938, 1939, and 1940, respectively, of 112 encephalitic cases that were tested, the sera of 97 (86.6 per cent) were positive for the virus of equine encephalomyelitis. Of 82 cases diagnosed as poliomyelitis, 5 (6 per cent) were also positive for the equine virus.

The sera of 6 out of 82 (7.3 per cent) well contacts and those of 29 of 41 (70.7 per cent) sick contacts (mild cases of infection) had neutralizing antibodies to the same virus.

The largest percentage of cases diagnosed as having equine encephalomyelitis during all 3 years came in the group under 10 years of age, with a noticeable number below 1 year. Males predominated over females among the encephalitic patients as well as among those having poliomyelitis.

The western virus of equine encephalomyelitis was recovered from the brain material of 1 infant and 1 adult during 1940.

TABLE 5
Sex Distribution of Neurotropic Virus Cases

Year	<i>Equine Encephalomyelitis</i>			<i>Poliomyelitis</i>		
	<i>No. of Cases</i>	<i>Male</i>	<i>Female</i>	<i>No. of Cases</i>	<i>Male</i>	<i>Female</i>
1938	22	12 (54.5%)	10 (45.5%)	27	19 (70.4%)	8 (29.6%)
1939	46	31 (67.3%)	15 (32.7%)	73	46 (63%)	27 (37%)
1940	48	33 (69.1%)	15 (30.9%)	18	10 (55.5%)	8 (44.5%)

The cases of human equine encephalomyelitis in Kern County began about May, increasing to a peak in August for the years 1938 and 1939, and in July for 1940, dropping off abruptly, with only a few through November. All cases were centered in the farming and irrigated areas in the central and western portions of the county, with none reported from the mountains or the eastern desert districts.

ACKNOWLEDGMENTS

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Epidemiology and Laboratory Diagnosis of Infectious Jaundice (Weil's Disease)*

JOSEPH G. MOLNER, M.D., M.P.H., F.A.P.H.A., AND
JOSEPH A. KASPER, M.D., F.A.P.H.A.

*Director of School Health Service; and Director of Public Health Laboratories,
Detroit Department of Health, Detroit, Mich.*

EPIDEMIOLOGY

THE clinical condition known as jaundice is a common occurrence in medicine. Its appearance in epidemic or near epidemic proportions is less prevalent. In 1745, the first actual description of this latter form of jaundice available in the literature was made by Cleghorn,¹ who reported its prevalence on the island of Minorca. Records of subsequent years indicate that similar outbreaks were reported by other investigators. Blumer² reports the disease occurred in America during the War of 1812, and alleged outbreaks are said to have occurred since 1857 in the United States.

Several French and German writers have also described epidemics of jaundice.^{3, 4} The outbreaks in Europe were noted to have affected primarily young male adults, particularly soldiers in trenches, sewer workers, and bargemen. In the description of the disease and in the reports of cases and outbreaks, the reference to etiological agent and possible sources of infection leads one to believe that these early investigators

were dealing with more than one form of jaundice. At least it is not improbable that the infectious type was confused with the sporadic or catarrhal forms of jaundice.

The presentation of a clear-cut clinical picture of infectious jaundice was not accomplished until 1886. In that year Weil⁴ published an account of 4 cases, characterized by chills, fever, myalgia, enlargement of the liver and spleen, occurrence of hemorrhages, and occasionally febrile relapses. It is on the basis of this excellent description of a relatively rare disease that the clinical condition described by Weil frequently bears his name.

A condition considered similar to Weil's disease had long been prevalent and recognized in Japan. In 1914, Inada and Ido and their associates⁵ described this malady as it occurred in Japan. After careful animal experimentation and the repeated observation of spirochetes in the tissues of guinea pigs inoculated with blood from patients suffering from the Japanese form of Weil's disease, these workers concluded that the etiological agent was a spirochete. In 1915, Uhlenhuth and Fromme⁶ announced that Weil's disease,

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encountered among German soldiers, could be transmitted to guinea pigs by inoculating these animals with the patient's blood. In 1916, Huebner and Reiter,⁷ apparently working independently, recognized a spirochete-like organism in the organs of animals inoculated with the blood of patients and chose to call the organism *spirocheta nodosa*.

Noguchi, in 1917,^{8, 9} described in greater detail the organism isolated from cases of jaundice. He classified it as *Leptospira icterohemorrhagiae*. In a later publication of his studies he reported finding virulent strains of *Leptospira* in the carcasses of rats trapped in New York. These strains were found to be pathogenic to guinea pigs and agreed in immunity and agglutination reactions with the Japanese strain isolated by Inado, Ido, and their associates.

Non-pathogenic saprophytic spirochetes morphologically similar to *Leptospira icterohemorrhagiae* have been found in natural waters all over the world. Wolbach and Binger,¹⁰ in 1914, found them in stagnant water. These organisms have since been found in mud of lakes and rivers, among decayed leaves, in puddles, slime, and in tap water. These water spirochetes are classified under the common name of *Leptospira biflexa*.

In addition to *Leptospira icterohemorrhagiae*, the pathogenic strains include *Leptospira hebdomadis*, the cause of seven-day fever of Japan; *Leptospira grippo-typhosa*, which causes the swamp fever of Europe; and *Leptospira canicola*, which produces a disorder in dogs resembling human icteroid infection. Of the various pathogenic forms named, *Leptospira icterohemorrhagiae* and *Leptospira canicola* are perhaps the most important. Certainly in the Detroit experience only these two types were encountered. Infections of *Leptospira icterohemorrhagiae* were the most prevalent. Even among jaundiced dogs 10

out of 12 sera examined gave positive agglutination reactions with this, the so-called classical strain of *Leptospira*. This experience is contrary to that of the California and Dutch observers who found infection among dogs to be primarily of the *canicola* type.

Weil's disease has been reported from all over the world. Schuffner¹¹ determined the serological identity of original strains isolated in the Netherlands, Japan, Germany, England, France, Italy, Greece, and the United States. He arrived at the conclusion that there exists a universal serologic specificity of *Leptospira icterohemorrhagiae*.

It is further propounded by Schuffner and Karl Meyer¹² that *Leptospira icteroides* are found only in environments accessible to rats. These animals carry the organisms in the tubules of the kidney and excrete them with the urine. Soil, food, and water contaminated with rat urine can become a potent source of infection. Rats obtained from all parts of the world have been examined and on an average 10 per cent have been found to be vectors of *Leptospira icterohemorrhagiae*, although some investigators have found as high as 33 per cent of the rats examined to be positive.¹²

Dogs may act as vectors of the true Weil's strain as well as *Leptospira canicola*. Schuffner¹¹ and Meyer¹² were able to isolate *Leptospira canicola* from persons suffering from an infection resembling Weil's disease. Bacteriologically and serologically, these investigators proved that human beings are susceptible to the dog-type of infection, and the result of such infection could be a symptom complex simulating Weil's disease. Although doubt is expressed regarding the possibility of acquiring *Leptospira icterohemorrhagiae* infection from a dog source, this question needs further consideration. In the course of the Detroit investigations^{13, 14} a case of Weil's disease was encountered which epidemiologically appeared to be of dog

origin. The case was that of a 3 year old child who developed the disease within a week after his pet was returned from a veterinary hospital. The dog had been confined in the hospital because of infectious canine jaundice, which was later proved serologically to have been caused by *Leptospira icterohemorrhagiae*.

Dissemination of the etiological agent through water should be seriously considered. Schuffner and his associates place a great deal of credence in infections acquired from water, either through swimming, accidental immersion, or attempts at suicide through drowning. It is generally conceded, however, that contamination of the unbroken skin with water containing the pathogenic strains of *Leptospira* probably will not result in infection. If, however, the horny layers of the epidermis are removed, the underlying epithelium offers no obstacle to the invading parasite.

In at least 3 cases of Weil's disease encountered by the writer the infection was apparently acquired from water. In one instance the patient probably acquired his infection while retrieving a golf ball from a heavily polluted stream; in the second case, the patient apparently acquired his infection while constructing a boat well; and in the third case, the patient, while digging a sewer from a trailer camp to a boat lane, accidentally fell into the water. The mode of infection in another case was probably water, although the evidence was too meager to warrant a definite conclusion.

The report of the Lisbon¹⁵ outbreak of Weil's disease indicates that the mouth and mucous membranes should be considered as important portals of entry for *Leptospira icterohemorrhagiae*. This unique outbreak occurred in 1931, and apparently the water from a public drinking fountain was the source of infection. Later it was shown that the un-

derground aqueducts were rat-infested.

As has been noted, a wet environment favors the propagation of *Leptospira*, particularly in such environment favorable if the reaction of the water or soil is alkaline. When such environments are associated with rat infestation we can expect to find the greatest incidence of infectious jaundice. Because of these factors, certain occupations present greater risks than others. The incidence of leptospirosis is more prevalent among miners, bargemen, garbage workers, abattoir workers, soldiers in trenches, and rice field workers. It is even stated that among swimmers the greatest risk is to those who swim the crawl stroke, since the possibility of oral infection is greatest in this particular method of swimming.

None of the Detroit cases studied seemed to have acquired its infection while swimming. Six cases, 3 of which proved fatal, were encountered among poultry workers. These persons worked as poultry strippers, graders, and inspectors. There are, as a rule, great numbers of rats in such establishments, and the workers frequently experience minor cuts and abrasions. It is probable that the infecting agent enters the body through these cuts after having been deposited on the work tables by the rats. Two cases of Weil's disease, one of which proved to be fatal, were encountered among persons who were trapping and handling rats.

By virtue of its prevalence among certain occupational groups this disease has its greatest incidence among males, and particularly young adult males. Cases among children and females are rare. One case of the infection reported in this country affecting a female was acquired in a laboratory.

Weil's disease does not show any definite seasonal variation. Sporadic cases may occur throughout the year. It has been noted, however, that an increase in cases may be expected dur-

ing the late spring and early fall. This is probably due to increased rainfall and consequent establishment of more favorable environment for the *Leptospira*.

The incubation period in this disease is estimated by Schuffner to be between 4 and 19 days, with an average of 10 days. The majority of Schuffner's cases developed the disease in about 7 to 14 days after exposure.

From an epidemiological perspective, it is logical to assume that the disease should exist in this section of the country. Here we have the infectious element, the susceptible persons, and the occupational groups at risk. This expectation of cases has been substantiated by the Detroit experience. During the past 2½ years, 13 cases of Weil's disease were recognized in this city. The number of reported cases does not present a true picture of the actual incidence. Schuffner, from his experience, estimated that only 40 per cent of all cases develop clinically manifest jaundice. And yet the principal clue for the investigation of cases heretofore has been the apparent jaundice associated with signs and symptoms of an infectious disease. If other criteria were established for the recognition of such cases or if laboratories equipped to do *Leptospira* agglutination tests were more generally available, it is reasonable to assume that many more cases would be recognized.

LABORATORY DIAGNOSIS

Since Schuffner¹¹ first adapted the agglutination-lysis procedure to the laboratory diagnosis of Weil's disease its usefulness in epidemiology has been receiving an ever widening recognition. It is perhaps the best single laboratory procedure through which the etiologic agent may be identified. The more recent studies of Schuffner,^{16, 17} as well as those of Packchianian,¹⁸ and Meyer and his associates¹⁹ indicate that while

Weil's disease is a distinct clinical entity, it may be due to infections of a number of serologically different strains of *Leptospira*. In view of these observations the laboratory which limits its serological studies in suspected cases to the use of only one strain of this infectious agent may fail in its purpose, and some cases of Weil's disease will remain undiagnosed.

Moreover, although the technic of this agglutination test is not difficult in itself, it is nevertheless important that the serologist who employs it should become proficient in recognizing the very slight reactions that often occur when the diluted serum is added to a thin suspension of *Leptospira* and the examination is made by means of dark-ground illumination. The difficulty of interpreting reactions will be greater when live suspensions are used. In order to obtain best results the test should be performed with formolized as well as live suspensions. The formolized antigen will serve to detect the *Leptospira* antibodies in the low-titered serum whereas their presence in high titer will be determined by the lysis reaction which occurs when the live antigen is employed.

Perhaps the greatest difficulty that will confront the laboratory desiring to equip itself for the diagnosis of Weil's disease will be in the maintenance of suitable cultures from which the antigen is to be prepared for the agglutination-lysis test. Cultivation of *Leptospira* in artificial media is not always the easy task that the literature on this subject would seem to imply. These organisms are very fastidious as to their cultural requirements, as was learned from our earlier disappointing experiences. A number of strains which seemed to be easily carried through several animal passages would suddenly die out when planted in artificial media, or, after showing apparently luxuriant growth after the first planting would fail to

develop upon being transplanted. The medium was prepared carefully and in accordance with Schuffner's formula which is given in detail in Meyer's recent report.¹⁹

When it was realized that Detroit tap water was not suited for the preparation of the culture medium, other waters were employed. Among those tried were specimens from running streams, from ponds, surface puddles and even rain and snow collected directly into glass receptacles. All were found to be unsatisfactory. Finally, during a heavy rainfall some water was collected as it drained down the side of a clay bank near the laboratory. This water was filtered through coarse paper and autoclaved. The fine particles which remained after this treatment were allowed to settle and the water was again filtered through paper. It was still slightly turbid when used to prepare the medium. Following the use of such water no more difficulty has been experienced in the cultivation of *Leptospira*. Over a period of approximately 5 months, three batches of medium have been successfully prepared. After 20 successive transplants there is no apparent abatement of growth in our stock cultures.

Analysis of the clay which was dissolved in this rain water shows it to be high in calcium, soluble iron, sulfates, and chlorides. In this connection it is interesting to note that Ono²⁰ mentions sodium chloride, calcium chloride, magnesium chloride, and ammonium chloride as being necessary for the growth of *Leptospira*.

Another factor considered essential for good growth of *Leptospira* is optimum temperature. Unless precautions are taken to prevent a rise above 30° C. in the incubator temperature the cultures may be expected to die out. During one summer period when the atmospheric temperature was unusually high it was difficult to maintain a low tem-

perature in a small incubator and all of the cultures were lost.

Of the other laboratory procedures that may be employed as aids in the diagnosis of infectious jaundice none should prove difficult. These include: (1) inoculation of young guinea pigs with blood, urine, and tissue material obtained during the earlier stages of the illness; (2) examination of blood, urine, and tissue scrapings from the liver and kidneys by means of dark-ground illumination; (3) histological studies of tissues.

A routine laboratory activity based upon the five procedures discussed will greatly improve the diagnosis of Weil's disease, irrespective of the period following its time of onset. The very occasional cases which are encountered in the earlier stages of this disease will prove most satisfactory for the isolation of the *Leptospira* by means of animal inoculation or culture. Direct darkfield examinations of defibrinated blood as well as the urine from such cases should also be made for the *Leptospira* that may yet be present in the circulating blood or be excreted in the urine. In the later stages this procedure is less applicable and the agglutination-lysis test will remain the only useful method to be employed for the diagnosis. In the rare instance of fatal outcome of a case of Weil's disease, the necropsy will provide tissues which can be used for animal inoculation, culture, and for histological study. The silver technic will prove most helpful in the preparation of tissues for microscopic study, either by the impregnation of blocks or staining of the sections. In positive cases the *Leptospira* are very easily demonstrated in the kidney, liver, or spleen. In one of our experimental animals these organisms were also found in the meningeal blood vessels.

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Tuberculosis Infection in Relation to Tuberculin Sensitivity in School Children*

Roentgenological Evidence—Second Report

R. S. GASS, M.D., WILLIAM J. MURPHY, M.D., E. F.
HARRISON, M.D., RUTH R. PUFFER, F.A.P.H.A.,
AND W. CARTER WILLIAMS, M.D., F.A.P.H.A.

Tennessee Department of Public Health, Nashville, Tenn.

THE Tennessee Department of Public Health has devoted special attention to a study of tuberculosis in Williamson County since December, 1931. Throughout this period a remarkable tendency toward the deposition of calcium in the lung fields and tracheobronchial lymph glands has been noted. Apparently, calcified lesions as demonstrated by the x-ray are present in a greater proportion of individuals in this area than has been reported in other parts of the country.

Shortly after this study was begun it was noted, also, that these calcified lesions were demonstrable in a considerable proportion of individuals with a negative tuberculin reaction. With a view to determining to what extent this occurred, a survey was made in the spring of 1937 in which the children in attendance at nine white and three colored schools were both tuberculin tested and x-rayed.

Old Tuberculin was used in the survey. The intracutaneous method of Mantoux was employed, the test being made first with 0.01 mg. and, if this

was negative, repeated with 1.0 mg. dosage. Readings were made 48 hours following administration. Chest radiographs were made on both positive and negative children and were read without reference to the tuberculin reaction. In this survey, the results of which have previously been published,¹ calcified lesions were noted with about equal frequency in both positive and negative groups.

In the spring of 1939 a similar survey was made in the same schools, employing a similar technic and using tuberculin of the same lot. Eleven hundred and thirty-two white and 280 colored children between the ages of 6 and 20 years were tested and x-rayed.

As in 1937, the tuberculin tests were read according to the degree or extent of the reaction. An area of edema surrounding the injection site of as much as 5 but less than 10 mm. in greatest diameter was read one-plus. Edema measuring 10 or more but less than 15 mm. in greatest diameter was read two-plus. Edema of 15 or more mm. in diameter was called three-plus. Any reaction, regardless of size, which resulted in necrosis was classed as a four-plus reaction.

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

All the films were read independently by two clinicians (R.S.G. and E.F.H.) without knowledge of the results of the tuberculin test. The two independent readings were then compared. In those cases in which a difference of opinion had occurred the films in question were withdrawn from the larger group and read jointly by the two clinicians. An attempt was made to classify the films according to the definiteness and degree of calcification noted. The following classification was used: 0 — negative, 1 — probable calcification, 2 — definite but limited calcification, and 3 — extensive calcification.

Of the 1,132 white children tuberculin tested, 83, or 7.3 per cent, were positive to the first test, 370, or 32.7 per cent, were positive to the second test, and 679, or 60.0 per cent, were negative. In the colored group 42, or 15.0 per cent, were positive to the first test, 68, or 24.3 per cent, were positive to the

second test and 170, or 60.7 per cent, were negative. The results of x-ray examination of each of these groups are shown in Table 1 and Chart 1.

In both white and colored children a somewhat higher proportion of those reacting to 0.01 mg. of O. T. showed calcified lesions than was found in either of the other two groups. The smallest proportion of lesions was found in those negative to a milligram. These differences are rather small in the white groups and somewhat greater in the colored. In neither race did the proportion of children showing calcified lesions in each of the three groups appear to show significant variations by age. At all ages, however, a smaller proportion of colored children showed calcified lesions than was observed in the white.

Children with extensive calcifications were no more likely to react to tuberculin than were those with more limited

CHART I

X-RAY FINDINGS ACCORDING TO TUBERCULIN REACTION OF WILLIAMSON COUNTY SCHOOL CHILDREN, BY COLOR, 1939

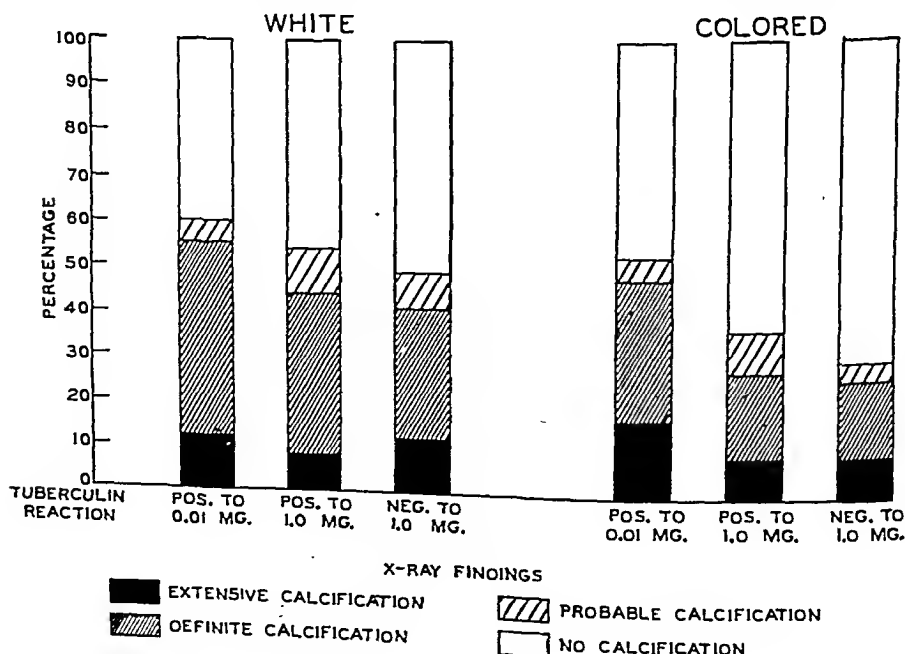


TABLE 1

X-ray Findings According to Tuberculin Reaction of 1,412 Williamson County School Children by Color, 1939

Calcification	Total Tested Number Per cent		Tuberculin Positive						Tuberculin Negative Number Per cent	
			Total Number Per cent		First Test (0.01 mg.)		Second Test (1.0 mg.)			
					Number	Per cent	Number	Per cent		
White										
Total	1,132	100.0	453	100.0	83	100.0	370	100.0	679	100.0
Extensive	121	10.7	40	8.8	10	12.0	30	8.1	81	11.9
Definite	367	32.4	168	37.1	36	43.4	132	35.7	199	29.3
Probable	92	8.1	40	8.8	4	4.8	36	9.7	52	7.7
Negative	552	48.8	205	45.3	33	39.8	172	46.5	347	51.1
Colored										
Total	280	100.0	110	100.0	42	100.1	68	99.9	170	100.0
Extensive	28	10.0	13	11.8	7	16.7	6	8.8	15	8.8
Definite	55	19.6	26	23.6	13	31.0	13	19.1	29	17.1
Probable	14	5.0	8	7.3	2	4.8	6	8.8	6	3.5
Negative	183	65.4	63	57.3	20	47.6	43	63.2	120	70.6

lesions. Of 121 white children showing extensive calcifications, 40, or 33 per cent, were tuberculin positive. Of 367 with definite but limited calcifications, 168, or 46 per cent, were tuberculin positive while of the 92 children showing probable calcifications 40, or 43 per cent, were positive. Findings in the colored children were not materially different.

After completion of the 1939 survey the records were checked against those of 1937 in order to identify those children who appeared in both surveys. Altogether, 573 white children and 150 colored children were tested and x-rayed in both 1937 and 1939. Since the number of colored children is relatively

small, consideration is given here to the white group only.

The tuberculin test and x-ray findings in 1939 were compared with those made on the same children in 1937. The results of the tuberculin test in both years are shown in Table 2.

In 1937, 42 children reacted to the first test and 35 more showed a reaction of two-plus or greater to a milligram. In 1939, the readings on these same 77 children were identical in 20 cases, higher in 28, and lower in 29. Of the 29 who showed lesser reactions in 1939, 7 were read negative to a milligram.

Somewhat different results were obtained with respect to the 158 children who showed a reaction of one-plus to a

TABLE 2

Results of Tuberculin Testing of 573 White Williamson County School Children, 1937 and 1939

Tuberculin Reactions 1937	Total	Tuberculin Reactions, 1939							
		4+ to 0.01 mg.	3+ to 0.01 mg.	2+ to 0.01 mg.	1+ to 0.01 mg.	3+ to 1.0 mg.	2+ to 1.0 mg.	1+ to 1.0 mg.	Neg. to 1.0 mg.
		3	18	14	12	12	36	129	349
Total	573								
4+ to 0.01 mg.	..								
3+ to 0.01 mg.	12	3	6	3					
2+ to 0.01 mg.	14		9	2	2		1		
1+ to 0.01 mg.	16		2	5	2	2	1	3	1
3+ to 1.0 mg.	6				1	1	1	3	
2+ to 1.0 mg.	29			1	4	3	9	6	6
1+ to 1.0 mg.	158		1		2	5	15	58	77
Neg. to 1.0 mg.	338			3	1	1	9	59	265

milligram in 1937. The readings on this group in 1939 were unchanged in 58 cases, higher in only 23, and negative in 77.

This group of weak reactors makes up a large proportion of the total number of positives. In 1937, the children showing a reaction of one-plus to a milligram comprised 67 per cent of the total number of positive reactors, while in 1939 the corresponding figure was 58 per cent. Moreover, of the 73 children who were read negative in 1937 and positive in 1939, 59 fall within this group. Of importance, therefore, is the question of the specificity of these weak reactions as a measure of tuberculin sensitivity. Likewise, even though the test may be administered with care and all interpretations made by the same individual, consideration must be given to the possibility that in repeating the test on the same group of children a certain number of changes in readings may occur due to slight variations in technic or interpretation.

In comparing the x-ray readings of 1939 with those of 1937, degree and definiteness of calcification were not taken into consideration. All readings were classed as either positive or negative. Previous readings of extensive, definite, or probable calcification were all considered positive.

Where disagreements were noted between the 1939 and 1937 readings, both films were withdrawn and compared. This was done without knowledge on the part of the clinician as to the nature

of the disagreement. A final reading was then given.

Table 3 shows a comparison of the 1939 readings with those made in 1937 together with the final interpretation.

Of 343 children classed as positive in 1937, 87 were read negative in 1939. Not all of these disagreements, however, resulted from variations in interpretation of the films. In 1937 a considerable number of lateral and oblique pictures were made on doubtful cases, whereas in 1939 only one single flat film was employed. The final readings on these 87 children indicated that calcium was present in 71 while 16 were negative.

Of 230 children called negative in 1937, 49 were read positive for calcium in 1939. Final readings indicated that calcium was present in 38, not present in 3, while in 8 there appeared to be an addition of calcium. It is noteworthy that in only 8 children did there appear to be an addition of calcium during this 2 year interval. This is in line with our findings which indicate that the proportion of high school children showing calcifications is not very much greater than that observed in children in the lower grades. It is apparent from these findings that readings made from a single flat film are subject to considerable variation in interpretation. Such variations are to a large extent eliminated when two or more films are employed.

The final readings represent interpretations based on at least two films.

TABLE 3

X-ray Readings of 573 White School Children Examined in Both 1937 and 1939

1937 Reading			1939 Reading			Final Reading (Serial Films 1937 and 1939)		
Calcium	Number	Per cent	Calcium	Number	Per cent	Calcium	Number	Per cent
Total	573	100.0	Total	573	100.1	Total	573	100.0
Positive	343	59.9	Positive	256	44.7	Positive	327	57.1
			Negative	87	15.2	Negative	16	2.8
Negative	230	40.1	Positive	49	8.6	Positive	46	8.0
			Negative	181	31.6	Negative	184	32.1

The net effect of increasing the number of chest radiographs was an increase in the proportion of positive readings. Thus, in 1937, 59.9 per cent of this group of children were read positive, 2 years later 53.2 per cent were read positive, while the final readings based on serial films gave a figure of 65.1 per cent.

It is reasonable to assume that with respect to both the tuberculin reaction and the x-ray findings a greater degree of accuracy may be expected from the combined results of the two surveys than from either one alone. With this in mind, the final x-ray readings were compared with the results of the tuberculin test in both years.

For the purpose of this comparison groupings were made according to the results of the tuberculin test. In group 1 were placed all those who were tuberculin positive in both 1937 and 1939 and who showed a reaction in one or both surveys of at least two-plus to a milligram. In group 2 were placed all those who were positive in one survey and negative in the other, as well as those who showed a reaction of one-plus to a milligram in both. Further breakdown of this group did not materially affect the results. In group 3 were placed those who were negative to a milligram in both surveys.

X-ray findings in each of these three groups are shown in Table 4.

A somewhat higher proportion of children in the first group show calcifications than is noted in either of the other two. The difference, however, is not great.

Of particular significance is the large number of children with calcifications in group 3. These children have all been negative to a milligram of tuber-

TABLE 4

Final X-ray Readings of 573 White School Children Grouped According to Tuberculin Reactions in Both 1937 and 1939

Group	Total	Calcification	
		Number	Per cent
Total	573	373	65.1
Group I	93	71	76.3
Group II	215	137	63.7
Group III	265	165	62.3

culin on two separate occasions and the x-ray findings are based on two or more films. If these calcified lesions are tuberculous in origin, the findings here presented indicate an appreciably higher level of tuberculous infection in this area than would be shown by the use of the tuberculin test alone.

SUMMARY AND CONCLUSIONS

Calcified lesions as demonstrated by the x-ray are found in a large proportion of school children in Williamson County. In a group of 573 children tested and x-rayed on two separate occasions, lesions were demonstrable in 373, or approximately two-thirds of the total number. A majority of these lesions are present by the time the child enters school. In school children there is little association between these calcifications and the tuberculin reaction. Though these lesions may have little clinical significance, if they are tuberculous in origin they would be of definite epidemiological importance in any attempt to estimate the prevalence of tuberculous infection in this area.

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Studies of Rebaking Cream-Filled Pastries*

F. W. GILCREAS, F.A.P.H.A., AND MARION B. COLEMAN,
F.A.P.H.A.

*Division of Laboratories and Research, New York State Department of Health,
Albany, N. Y.*

IN spite of the widespread publicity regarding the rôle of cream-filled pastries in food poisoning, the number of outbreaks attributable to them proves that either the bakers or the consumers fail to take the necessary preventive measures.

Stritar, Dack, and Jungewaelter¹ and Korff² have reported that custard-filled pastries may be reheated to destroy staphylococci without impairing the flavor or appearance of the product. Korff states that about 15 bakeries in Baltimore were using this procedure in 1936 and finding it satisfactory. There is no evidence, however, that bakeries in general recognize its importance. It therefore seems desirable, in order to provide further data in support of the practice, to report the results of a few experiments undertaken for purposes of confirmation.

Experiments were conducted to determine: (1) the time and temperature of rebaking necessary to render non-viable an enterotoxigenic strain of staphylococcus in the custard filling in éclair shells; and (2) the palatability of rebaked custard-filled éclairs, chocolate cream pie, and Boston cream pie.

EXPERIMENT I

The éclair shells used were purchased from a local bakery, and the boiled custard was made in the laboratories for the preparation of media. Each experiment was repeated on three different days.

CUSTARD	
Milk	225 ml.
Water	100 ml.
Saccharose	53 gm.
Cornstarch	15 gm.
Sodium chloride	0.5 gm.
Eggs	1
Vanilla	3 ml.

The milk and 80 ml. of water were combined and heated in a double boiler. The saccharose, cornstarch, and salt were mixed with the remaining water and the slightly beaten egg. Part of the hot milk and water was added slowly to the cold ingredients, and the whole mixture was cooked in the double boiler until thick. This custard was dispensed in glass jars and autoclaved for 20 minutes.

Inoculum—The strain of *Staphylococcus aureus* used was isolated from an infected wound on the hand of a baker who prepared cream puffs that had induced food poisoning. Cats fed with boiled custard in which this strain had been grown vomited and had diarrhea.

The custard was inoculated with a broth culture of the staphylococcus and stirred with a sterile spoon. It was kept at room temperature for 2 hours, after

* Read at a Joint Session of the Laboratory, Food and Nutrition, and Epidemiology Sections of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

which the eclair shells were filled by means of a 20 ml. syringe.

Baking—Two shells filled with inoculated and one with uninoculated custard were included in each experiment. Each group of three eclairs, on a rack in a covered baking pan, was placed in a well insulated electric muffle furnace previously heated for 4 hours to insure an even temperature. Heating periods of 15, 20, 30, and 40 minutes were employed in each experiment. During the baking, the temperature was maintained between 216° and 220° C. (420°–428° F.); rapid manual control within the muffle was possible by use of a rheostat and a thermometer inserted through the furnace door.

At the end of each baking period, the pan was removed, the cover lifted, and a thermometer thrust into the uninoculated eclair. Two minutes were allowed for the mercury to come to equilibrium, after which the cooling rate of the custard was observed. The eclairs were immediately transferred to a wire rack to facilitate rapid cooling.

Bacteriologic examination—The following samples (0.5 ml.) of the custard were examined: one immediately before the shells were filled, four from each eclair immediately after baking and cooling, and one after the rebaked pastries had remained at room temperature overnight. The samples were collected with a 1 ml. syringe, and each was thoroughly mixed with 4.5 ml. of beef infusion broth to make a 10-fold dilution. From this, 100-, 1,000-, and 10,000-fold dilutions were prepared with broth. Poured plates were made from (1) the 10,000-fold dilution of custard before filling the shells, (2) the 10-fold dilution after baking and cooling, and (3) all four dilutions after the rebaked pastries had been left at room temperature overnight. Promptly after preparation 1 ml. of each dilution was pipetted into a Petri plate, and 12–15 ml. of melted dextrose beef infusion agar were

added. The plates were incubated for from 18 to 20 hours.

All the broth dilutions of custard samples collected after baking were also incubated and examined on the following day.

RESULTS

1. Bacteria counts showed the presence of from 200,000 to over 3,000,000 bacteria per ml. (most of which may be assumed to be staphylococci) immediately before the shells were filled.

2. In the filling from eclairs that had been heated for 15 minutes or longer, no viable staphylococci were demonstrated either immediately after cooling or after they had remained at room temperature overnight. Heating longer than 20 minutes was found impractical as the shells became definitely toasted; heating for 30 minutes or longer produced charring.

3. The temperature of the cream filling remained above 71° C. for over 5 minutes after removal from the oven; thus the thermal conditions were well above those of short-time pasteurization, 71° C. for 15 seconds.

EXPERIMENT II

The experiments to determine the effect of rebaking on the appearance and palatability of custard-filled pastries were carried on in the staff luncheon room under the direction of a member of the laboratory staff. Eclair shells and custard filling were prepared by the cook in the usual way. After the shells were filled, one-half of them were returned to the gas oven in which the temperature was held at 216° C. for 20 minutes. After removal from the oven, they were transferred to a wire rack to allow free circulation of air and, when cool, were topped with chocolate icing. In this experiment it was observed that toasting or charring occurred more quickly in sheet-iron pans than in aluminum pans.

These eclairs were served to 15 members of the staff, and some prepared at the same time but not rebaked were served to 19. As each person left the luncheon room, his opinion regarding the pastries was asked. Only 3 individuals who had eaten the eclairs knew that the experiment was being conducted; the only one who gave an adverse criticism was one of these, who had had a rebaked eclair. Indifference was expressed by 3 persons, 2 of whom had rebaked pastries. The remaining 30, 12 of whom had rebaked eclairs, all reported favorably. No appreciable difference in the taste of the pastries before and after rebaking could be detected. In some instances, the rebaked shells showed evidence of a slight toasting but this did not impair the flavor.

On another day, one of a number of chocolate cream pies prepared in the usual way was returned to the gas oven at 216° C. for 20 minutes. When cool, it was topped with whipped cream and served to 6 members of the laboratory staff, 3 of whom knew of the rebaking and 3 who did not. All reported the food very satisfactory.

Boston cream pie was also rebaked and served in the luncheon room. The cake was prepared and baked as usual and two layers with a custard filling returned to the oven at 216° C. for 20 minutes. This dessert was served to 10 members of the staff, and a Boston cream pie prepared from the same ingredients but not reheated, to 10 others. Unqualified approval was expressed in regard to the rebaked pie as well as the other.

DISCUSSION

This method of rebaking eclairs or cream puffs and Boston cream pie mini-

mizes the opportunity for introduction of enterotoxigenic microorganisms. The use of freshly prepared custard and prompt rebaking are, of course, essential to insure the absence of preformed thermostabile toxins. Korff reported that the method followed by the Baltimore bakers consisted of rebaking one layer of cake with the custard on it. When cool, the second layer of cake was placed upon this. Obviously, the filling in this cake might become contaminated. It is also true that the cream filling in a pie rebaked as in our luncheon room and topped with whipped cream when cool would be subject to contamination. Such pies prepared in bakeries, however, are almost invariably topped with meringues. It is suggested that after rebaking for 15 minutes the pie be removed from the oven, topped with the meringue, and returned to the oven at a lower temperature, about 148°-162° C. for approximately 8 minutes, the time necessary to bake the latter.

CONCLUSIONS

Staphylococci in custard filling in eclair shells were rendered nonviable by heating for 15 minutes at from 216° to 220° C. (420°-428° F.).

Rebaking eclairs, chocolate cream pie, and Boston cream pie for 20 minutes at 216° C. did not impair the appearance or palatability of the pastries.

The adoption of this procedure in bakeries should reduce greatly the incidence of food poisoning induced by the enterotoxins of staphylococci in custard-filled products.

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Types of Personnel in Public Health Statistics*

THE Preliminary Report of the Subcommittee on the Educational Qualifications of Public Health Statisticians, approved by the Committee on Professional Education, of the American Public Health Association, was published in the AMERICAN JOURNAL OF PUBLIC HEALTH, July, 1937. It was approved later, October 25, 1938, by the Governing Council of the American Public Health Association.

Recently the report was submitted to a small group attending the Second National Conference of State and Local Registrars held in Washington, D. C., March 28, 1941, for deliberation and suggestions for revision in case the group should feel that modifications are desirable in view of the expansions in public health work and administration which have occurred in public health with particular reference to public health statistics, since the publication of the report. The group to whom the report was referred for study was made up of the following:

S. D. Collins, Ph.D., Principal Statistician,
U. S. Public Health Service

H. L. Dunn, M.D., Chief Statistician for
Vital Statistics, Bureau of the Census,
U. S. Department of Commerce

Marguerite F. Hall, Ph.D., Assistant Pro-
fessor of Public Health Statistics, Uni-

versity of Michigan (Chairman—representing Dr. Sundwall)

J. T. Marshall, Director Division of Vital Statistics, Provincial Board of Health, Victoria, British Columbia; also President of the American Association of Registration Executives

The group is of the opinion that there is no need for a revision of the report at the present time. However, it feels that the time has come when we should recognize several types of personnel in the field of public health statistics. The following types are identified:

I. Major Types:

1. *The Statistician - Coördinator*—

Technical assistant and adviser to the health commissioner. The interests and activities of the statistician-coördinator should be largely in investigation and research. In addition to meeting the educational qualifications specified in the Report on the Education Qualifications of Public Health Statisticians, he should possess a broad background of experience which will enable him to serve as a consultant in the setting up of problems emanating from the directors of the several divisions or bureaus of a department of health and also in the analysis and interpretation of the statistical data accruing from the treatment of the problem. He should also be interested in and capable of initiating research and investigation in matters pertaining to public health administration.

2. *The Statistician-Registrar*—The functions of the statistician-registrar

* Report presented by John Sundwall, M.D., Chairman of the Subcommittee on the Educational Qualifications of Public Health Statisticians to the Committee on Professional Education at its meeting on April 18. It represents comments made to the subcommittee by a small group who attended the Conference of State and Local Registrars in Washington on March 28, 1941, and is published here in order to encourage expression of opinions from all who are interested.

should be those ordinarily ascribed to a supervisor, chief, or director of a bureau or division of vital or public health statistics in a governmental department of health. He should meet the educational qualifications specified in the report.

3. *Statistician*—The statistician, who should also meet the educational qualifications recommended in the report, should serve as an assistant to the statistician-registrar or to the statistician-coördinator. He should or may look forward to a career as a statistician-registrar and perhaps eventually as a statistician-coördinator.

It is apparent that it is only in the larger departments of health that these three major types of personnel in public health statistics will be employed. However, they are now being identified and the American Public Health Association should recognize them. The educational qualifications of these three major types of professional personnel in public health statistics are the same as specified in the Report on the Educational Qualifications of Public Health Statisticians of the Committee on Professional Education of the American Public Health Association. Satisfactory experience and personal qualifications will largely determine the selection of personnel for each type or grade of service. Generally, it will be progression from one type to another.

II. *Minor Types:*

1. *Junior Statistician*—The educational preparation of the Junior Statistician should include courses of study in mathematics and statistics adequate to do intelligent routine statistical work, including operation of the machineries utilized in statistics. He need not meet the broad educational qualifications in the physical, biological, and social sciences and in public health as specified in the report. The junior statistician acquires his knowledge largely through apprenticeship or internship in the statistical division of a health department.

2. *Statistical Clerk*—Capable of carrying on routine statistical work in a local unit. No special educational qualifications are specified for this type of personnel. It need not be as basic as that of the junior statistician.

With a view of obtaining the reactions of public health statisticians, public health officers, and other personnel to these recommendations relative to the classification of public health statisticians, it is recommended that this "Follow-Up" Report on the Educational Qualifications of Public Health Statisticians be published in an early number of the AMERICAN JOURNAL OF PUBLIC HEALTH.

Comments and suggestions are solicited from all who are interested.

JOHN SUNDWALL, M.D.,

Chairman

Comparison of Undechlorinated and Dechlorinated Swimming Pool Waters*

24 and 48 Hour Plate Counts of Samples

Discussion by C. A. HOLMQUIST, F.A.P.H.A., State Department of Health, Albany, N. Y., of a paper by THOMAS M. RIDDICK, M.S.C.E., which appeared in August issue of the JOURNAL.

THE paper by Mr. Riddick focuses attention upon the satisfactory results secured when properly designed and constructed swimming pools are operated under technical control. Mr. Riddick seems to emphasize four important factors, namely: (1) Samples of chlorinated water collected at swimming pools should be dechlorinated at the time of their collection. (2) The number of miscellaneous bacteria in swimming pool water was maintained in the pools under discussion lower than required by even rigid standards. (3) The 48 hour agar count of samples of chlorinated water more closely parallel the concentration of coliform organisms than is the case with the 24 hour count. (4) The concentration of residual chlorine was increased with higher bathing loads rather than a constant value being used for control purposes.

The desirability of dechlorinating samples as they are collected from swimming pools is well established and need not be discussed at this time.

Experience has indicated that properly operated pools will meet rigid requirements as to bacterial quality of the water, whereas improperly operated pools fail to meet even the more lenient requirements. This does not indicate,

however, that a quantitative bacterial standard has been developed which is based upon definite proof that failure to meet the standard will indicate that the use of the pool would constitute a menace to the health of the bathers. Therefore, any official standard stating definite requirements which must be met to justify the issuance of a permit to operate a pool by the enforcing agency cannot be as rigid as advocated by Mr. Riddick.

It seems pertinent, therefore, to analyze the implications of existing quantitative standards as to bacterial quality of water referred to by Mr. Riddick. The bacterial standard for potable water serving interstate carriers, in effect, requires that 50 per cent of a series of samples will have a coli index of 1.05 or less per 100 ml. of water, but permits 5 per cent of the samples to have an index of 8.8 or greater per 100 ml.

The quantitative requirements suggested in the swimming pool standards developed by the committee of the American Public Health Association on "Swimming Pools and Other Public Bathing Places," namely, that not more than 15 per cent of the samples shall be positive in one or more 10 ml. portions of the samples examined states in effect that not more than 15 per cent of the samples may have more than 2.2 coliform organisms per 100 ml. This is

* Read before the Engineering Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

equivalent statistically to requiring a quality of water superior to that outlined above for potable water.

The present requirements of Regulation 10 of Chapter VI of the New York State Sanitary Code, which Mr. Riddick regards as lenient, also are in reality more stringent than the above mentioned potable water standards, inasmuch as the regulations specify that not more than 40 per cent of the 10 ml. portions of a series of samples may be positive, which is equivalent to saying that the *maximum* permissible coli index is 5.0 per 100 ml. of water. Because of this situation, we are now considering enacting a standard which would be somewhat more lenient than those for potable water, yet sufficiently positive to secure the desired results. Such standard would provide an average coli index of 2.2 per 100 ml. or less, provided the index is less than 38 per 100 ml. in 90 per cent of the samples. Such a standard would be worded as follows:

Tests for Organisms of the Coli-aerogenes Group—Not more than 50 per cent of the samples in a series of samples collected from an artificial pool shall have a "Most Probable Number Index" for organisms of the Coli-aerogenes group, exceeding 2.2 per 100 ml. of water and not more than 10 per cent of the samples in the same series shall have such an index exceeding 38 per 100 ml. of water.

In the present state of our knowledge regarding bacterial quality of water in swimming pools, no definite conclusions can be reached as to the sanitary importance of numerical number of miscellaneous bacteria developing on agar after either 24 or 48 hours incubation. Pending the discovery of a specific "indicator organism," which is related biologically to some significant group of pathogens of importance in the control of swimming pools, stress will have to be placed upon the maintenance of a "state of cleanliness" in a pool as is the case with dishwashing technic. The 37° agar count seems to serve as a

satisfactory indicator of cleanliness but we have no quantitative evidence that the 48 hour count in itself is any more significant than the 24 hour count. On the other hand, the data collected by Mr. Riddick disclose that the 48 hour agar counts are correlated much more closely with the concentration of coliform organisms than is the case with the 24 hour count, due, of course, to the presence in chlorinated swimming pool waters of organisms which develop slowly on agar. It is hoped, therefore, that Mr. Riddick's paper will stimulate additional investigation of this subject in order that additional data may be available to support any needed modification of the present bacterial technic.

The policy of increasing the concentration of residual chlorine maintained in pools with increases in bathing loads is not generally practised because most operators apparently consider that the increase in the chlorine dose made to compensate for the increase in the chlorine demand incidental to changes in the bathing load will maintain uniform disinfection by the resulting uniform concentration of residual chlorine. There is growing evidence, however, that the "activity" of any given concentration of residual chlorine is influenced by the organic content of the water. Therefore, correspondingly higher concentrations of residual chlorine seem to be needed with increases in organic content to be anticipated with increasing bathing loads.

This subject has many ramifications not referred to in Mr. Riddick's paper, but it would seem that greater attention should be given to those factors which modify the rapidity of disinfection by chlorine, such as pH, ammonia content, organic content, the effect of sunlight, temperature, etc., in order that practical guides may be developed for use by swimming pool operators. Pending the development of a simple technic for determining the oxidation potential of

water or its equivalent, greater attention should be given to comparison of the relative values secured by the so-called "flash test" with the more acid (20 per cent) orthotolidine reagent and the conventional orthotolidine test, to

disclose the "state of activity" of the residual chlorine present.

There is need for technical discussion of the problems in the operation of swimming pools similar to this paper by Mr. Riddick.

The Mothers' Charter

EVERY potential mother envisions the pleasures and obligations of creating and sustaining new life and is entitled to health and protection for the benefit of herself and humanity and she should have:

1. The inherent right to be well born without inherited or transmitted defect or disease.
2. The inalienable right to protection from disease and harmful influences.
3. The opportunity to learn and know herself during adolescence and maturity and to acquire a knowledge of the origin and significance of human life.
4. The right to protection from pitfalls of married life and to a knowledge of its significance to herself and her potential family.

5. The privilege of proper premarital and preconceptional medical examination and advice and care for herself and her mate.

6. The right of proper and adequate care during pregnancy.

7. The right to receive adequate and necessary care during labor in her home or hospital.

8. The right to have appropriate care following labor in her home or hospital.

9. The right to secure proper and continuing subsequent care for herself and baby.

10. The right of preservation of health and life and happiness for herself and family.

A "Mother's Charter"—drafted by Dr. Fred L. Adair, Chairman of the American Committee on Maternal Welfare.

Organization, Supervision, and Objectives of Prenatal Medical Care*

E. D. PLASS, M.D.

Professor and Head, Department of Obstetrics and Gynecology, State University of Iowa, Iowa City, Ia.

PRENATAL supervision has been so widely accepted in principle by both the profession and the laity that there is no longer any need to argue its value or defend its practice. The idea that medical supervision might help reduce maternal and infant mortalities took shape early in this century, but had a long hard struggle for recognition in a medical world dedicated to curative technics. Eventually, however, the statistical evidence accumulated from personal and group experience, bolstered by confidence in the growing science of preventive medicine, has shown its virtues, and a certain part of the recent remarkable improvement in maternal death rates is commonly attributed to its influence.

The objectives of prenatal care are to provide "complete supervision of the pregnant woman in order to preserve the life, health, and happiness of the mother and child" and to "enable her to withstand the unavoidable strain associated with labor and delivery." It is only through such attention that "diseases which may cause death or disability of either the mother or the child may be avoided, arrested, or cured."

Obviously these objectives may be attained through the usual physician-patient contacts or through group or clinic practice. There can be little doubt that the former is the more desirable, provided the attendant is specially trained in obstetrics, is conscientious in his attention, and can be adequately remunerated for his services. Probably the best available prenatal care is that provided by the obstetric specialist to his private clientele; just as the most inadequate supervision is offered by the general practitioner who is interested only in curative medicine. At least in certain areas, one fact which has militated against proper antepartum attention by individual practitioners is the practice of charging for prenatal visits on the office-call basis rather than making a single charge for obstetric patients, which includes not only the delivery, but necessary antepartum and postpartum attention and advice. It is believed that cessation of the older practice would do much toward improving the situation, and that the younger generation of medical men will eliminate it and its disadvantages.

There is, however, a large group of childbearing women, possibly 50 per cent of the whole, who do not have the financial resources to seek prenatal care on a private patient basis, and who must therefore either forego its advan-

* Read before the Maternal and Child Health Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

tages or attend clinics when and where available. The larger general and maternity hospitals in the more populous areas conduct more or less elaborate prenatal establishments in connection with their general clinic work. In most of these institutions the antepartum clinics are under the supervision of trained obstetricians and are manned by younger men who aspire to that distinction and who look upon the work as a valuable part of their training. The proximity of various laboratories and special diagnostic equipment and the availability of expert consultants make for efficiency, but the multitude of patients and the changing clinic staff destroy much of the personal relationship which is such an important part of private practice. These patients probably receive care which is surpassed, if at all, only by the well-to-do who can command individualized expert attention. There can be no doubt that adequate medical supervision without the personal contacts is more effective than a deluge of personality with no sound medical approach. If the poor patient really wants proper care and will look for it in the larger cities, she can find it.

In smaller communities and rural areas the situation is much more difficult because of the absence of large hospitals and well trained specialists. A certain amount of excellent prenatal supervision is provided by individual physicians, but until recently facilities for giving such service to those in the lower economic groups was practically nonexistent. The extent of the problem is indicated by the fact that up to July 30, 1939, the health departments of 34 states had established 1,190 maternity centers through the coöperation of the Children's Bureau under the Social Security Act. In spite of this federal contribution, there were approximately 2,500 counties where no state supported clinics were in operation and where group prenatal care was available only

through an unknown, but not large, number of clinics conducted by hospitals, outclinics, and other public and private agencies. It seems fair to assume that hundreds of thousands of pregnant women have no opportunity to receive any prenatal supervision.

The organization of adequate prenatal programs in the larger institutions presents a simple problem because of the availability of trained personnel and modern facilities, but the development of effective units in smaller communities is far more difficult. The standards of prenatal care, as developed originally by the American Committee on Maternal Welfare and later adopted and amplified by the Children's Bureau, are relatively simple—a careful history, a complete physical examination, and simple laboratory tests. The collection of these data, with few exceptions, can be carried out by any practising physician, but their interpretation demands special training and experience so that the information elicited may be of the utmost value to the patients. It is for this reason that obstetric specialists are best equipped for this work. When they are not available, as is frequently the case, certain local physicians who are interested in obstetrics should be assigned to the work, preferably those who have had some special training. Provision should then be made to give the chosen group some form of instruction so that there may be uniformity of practice.

It may be suggested that the community physicians serve the clinic in some form of rotation. Aside from the objection that this would completely eliminate uniformity of procedure and conformity of advice, it should also be recognized that many members of the profession are equipped neither by temperament nor training to carry on the program. The smaller the number who coöperate, consistent with the size of the clientele, the more efficient the effort is likely to be. Not only will responsi-

bility be more localized but there will be more opportunity for the individual patient to have the type of continuous advice and counsel which is the essence of private patient care. Moreover, certain of the standard requirements, such as pelvic mensuration and early bimanual vaginal examination, require constant practice if the results are to be dependable. The mere fact that a pelvimeter is available and used has no significance—it must be employed correctly.

It is advisable for these small and occasional clinics to have available a consultant who can give advice on those complications which inevitably arise. In some states this need has been met by the appointment of a consultant who makes periodic visits to each clinic to advise with the local practitioners and to examine patients about whom there is some question.

If one assumes that any care is better than none, it must be agreed that any organized prenatal clinic is meeting the objectives of the program to a greater or less extent. There is, however, good reason to believe that in many instances it is less rather than greater. For example, it is reliably reported that in one rural area where 14 practitioners were receiving generous remuneration for providing prenatal care to an indigent group, there were only 2 pelvimeters available. The agreement also provided that each prenatal case report should contain the original record of the serologic test for syphilis from the state laboratory. One participant who was unfamiliar with the technic of venipuncture introduced reports covering the test on cord blood, thus complying with regulations even though he completely nullified the purpose of the requirement. It took some time to eliminate these difficulties, but the work is now progressing smoothly and the community is better for it—both maternal and infant death rates have been materially reduced.

It is always dangerous to generalize,

but on the basis of a limited contact, it is my belief that prenatal supervision as it is now carried out frequently fails to meet its objectives and that the recognized standards are not being met, or are being followed only in form and without serious effort to develop their full usefulness.

Education and supervision apparently offer the best chance for improving the situation as it now exists. Elaborate physical equipment is not required, since there is need only for sufficient space for the patients and staff, and for ordinary clinical facilities. One or two dressing rooms and examining tables should be available, with scales, pelvimeters, sphygmomanometers, and an assortment of specula, catheters and similar instruments. There should be an arrangement for carrying out the simpler laboratory examinations and the possibility of having more technical investigations made in a nearby institution. Those who operate prenatal clinics should be carefully chosen on the basis of interest and training, and should then if possible be subjected to additional instruction not only in the performance of the various technics but in interpretation of the results. Moreover, arrangements should be made for periodic visits by a specialist consultant.

It seems obvious that any great future expansion of prenatal clinics will be under the aegis and with the financial support of some governmental agency, a situation which will be deplored by many, but which should lead to more uniform and better care. Attention should be given to securing continuity of contact and advice in order to preserve the desirable features of the physician-patient relationship. The personnel of the clinics should be chosen on the basis of interest, ability, and conscientiousness, and provision should be made not only for their continued instruction but for periodic and adequate specialist consultation.

MILBANK FUND ANNUAL CONFERENCE

FOREWORD

FOR the first time in the history of the Milbank Memorial Fund the reports on one of its annual conferences, by invitation, appear in the *AMERICAN JOURNAL OF PUBLIC HEALTH*. My sincere thanks for this opportunity are due to the Executive Secretary of The American Public Health Association, to the Editor of the *JOURNAL*, and to its Editorial Board.

The pattern of these annual conferences has been set as the result of long experience, but there is nothing fixed or rigid about the subject matter. Each subject is discussed at a round table; after the subject has been selected, a score of the leading authorities, particularly those who have thrown fresh light on the subject or developed new points of view, are invited to participate. Free discussion on a high technical plane is secured when attendance at the round table is restricted to a score of those who are thoroughly familiar with the subject, and who have something tangible to contribute.

As the Milbank Memorial Fund concerns itself with the public health, the subjects of discussion at its round tables relate in general to that field. But to fit the case, that relationship must be broadly interpreted. The main task of an official health agency is to apply, for the benefit of its people, public health measures which experience has shown to be effective. The Fund on the other hand has no such responsibility. It is concerned with the growing edge of public health work. It is its business to explore, experiment, appraise, and question to the end that new effective ways of preventing disease and maintaining health may be found and discredited methods abandoned. This is an enormous task which no single agency could undertake single handed. Fortunately it is shared by many private and official agencies so that small contributions from several add up to a respectable total.

Many health officers may be surprised to note that the results of research into problems of population were the subject of discussion at one of the three round tables. It is true that health departments are concerned with births and deaths, but it is not usual for them to go more deeply into problems of population. Nevertheless, accurate knowledge of population trends is essential to the public health statesman, for these trends may very largely determine the character of the problems which will confront health departments in future. The decline in the incidence of the infectious diseases of childhood is due in part to the decline in the relative number of individuals in this age group, and these infectious diseases will continue to decline from this cause alone. The importance of health problems associated with adult life and old age is greatly increased by present population trends, and maternal and infant health may be improved or worsened by the presence or absence of facilities for spacing births.

Studies of fertility levels in this country have shown that a disproportionately large amount of the population increase comes from a few regions in the country where health, educational, and economic facilities are the poorest. This may have

some bearing on the fact that little improvement is noted in the results of selective service examinations since 1917.

All of the subjects assigned to the three round tables have some bearing on the defense of our country in this emergency. New methods of waging war have placed the whole population under stress; any weakness in the civil population affects the efficiency of the whole war machine. Production of the weapons of defense is just as important as the proper use of those weapons. We must learn to maintain the health of defense workers at as high levels as that of the armed forces. Under these conditions the public health has come to assume new significance; the state has a greater interest than ever before in the physical and mental health of its citizens.

The Round Table on Health Problems in National Defense brought out the striking fact that approximately 40 per cent of our young men (21-35) are either unfit for military service or are suited for limited service only. Should the need arise for larger armed forces, it is probable that standards would be lowered and greater numbers inducted in spite of certain physical defects. It should be borne in mind that defects which incapacitate an individual for military service also make him unfit as a rule for efficient work in a defense industry. Lowering of standards would result in less effective army, navy, and air force. Employment of the rejectees in industry must have a similar result.

The growing edge of public health is strikingly represented by the report of the Round Table on Nutrition in National Defense. Here is a vast new field whose possibilities have hardly been explored. Someone has suggested that the recent decline in maternal mortality may be due to the improved diets of pregnant women on relief. Certainly the report from Toronto would appear to show that both mothers and infants emerge from labor in vastly better condition if the inadequacies of the mother's diet from the fourth or fifth month of pregnancy are properly supplemented. The full report of this study is to appear in an early number of the *Journal of Nutrition*; it should be read by every health worker.

The reports which follow are summaries of the individual reports presented to each round table and of the discussion which followed. Some of the papers prepared for the Conference will appear in the Milbank Memorial Fund's *Quarterly*, to which the reader may be referred for more detailed information. A feature of the Annual Conference which cannot be included in the JOURNAL is the cross-discussion at the concluding general session by participants from the different round tables. Such cross-discussion has been likened to cross-fertilization; it is an attempt to break down some of the mental barriers which are too apt to separate specialists in one subject from those working in allied fields.

Unfortunately, it is impossible to widen the circle of those who attend the conference without destroying at least some of its effectiveness. For this and other reasons, I am most grateful to the editors of the JOURNAL for making these reports available to so large a number of interested readers.

FRANK G. BOUDREAU, M.D.
Executive Director

HEALTH PROBLEMS IN NATIONAL DEFENSE*

G. CANBY ROBINSON, M.D., *Chairman*

IT is safe to say that never before has medical knowledge and skill been at a higher level than at present; that public health work is more efficient and better organized than ever before; our standard of living has attained a relatively high level; our steadily declining mortality is a favorable expression of national health. In spite of these attainments, now that we are in a state of national emergency, we are faced with the fact that about 40 per cent of the young men of our country at ages 21 to 35 are either considered physically unfit to enter training for military service or are fit for limited service only. This fact may be considered as an important index of our national health at ages which are economically the most productive years of life. The physical status of the civilian population, because of its industrial and social value, is of grave concern to us, and it is this problem of health in national defense that was the subject of our round table conference.

A review of present scientific opinion concerning prevention or correction of the defects and conditions which are the most frequent causes of rejection of young men called for training by the Selective Service System, was our chief concern. As a background for our discussion, preliminary data, giving the detailed causes of rejection by Selective Service local boards and induction centers, were presented by Mr. G. St. J. Perrott. Twenty-eight per cent were classed as unfit for any military service, and an additional 15 per cent were considered as fit for limited service only. The leading causes of rejection were: defective or deficient teeth, eye diseases, orthopedic impairments, diseases of the cardiovascular system, nervous and mental diseases, hernia, tuberculosis, and venereal disease.

The most striking difference between the results of 1917-1918 and today is the present high percentage of rejections because of defective teeth, which are over four times as high as in the World War draft. These results may point to an increase in the prevalence of dental disease since 1918, although other factors are undoubtedly involved.

Rejections for respiratory disease (largely tuberculosis) are only a little lower than in the World War (1.7 per cent as compared with 2.0 per cent). This probably means better case finding at the present time. Rejections for venereal disease constitute 1.6 per cent of men in the present examinations as compared with 0.5 per cent in the last draft. This higher percentage need not indicate an increase in the prevalence of venereal disease since 1918, but is probably due to more rigid standards today which exclude men with venereal disease and to the use of better diagnostic methods.

In spite of the higher percentage of rejections reported today than in 1917-1918, it cannot be said that the physical status of young men has deteriorated since the World War. Neither can it be said that the health of young men has

* Report of the Round Table on Health Problems in National Defense at the Nineteenth Annual Conference of the Milbank Fund.

improved. Differences in physical examination standards, in technic of examining physicians, and other factors make comparison difficult until the data can be analyzed in more detail. Rejections for defective teeth are obviously higher in 1941 than in 1918; otherwise, the important causes of rejection today are the same as those in the World War draft.

HEALTH ACTIVITIES NOW BEING CARRIED ON AS A RESULT OF DETECTION OF REPORTABLE DISEASES

Selective Service examinations offer an unusual opportunity of case finding on a wide scale. What is being done about newly discovered cases of two reportable diseases, tuberculosis and syphilis, was discussed by Dr. H. R. Edwards and by Dr. Theodore Rosenthal.

According to Dr. Edwards, army plans for examination of all men at the induction centers include a chest x-ray. All men showing evidence of reinfection tuberculosis, active or apparently arrested, are rejected.

The U. S. Public Health Service has urged that the Selective Service Boards, as well as army Induction Stations, set up a plan for the reporting of all cases of tuberculosis to the state or local department of health. Little information is available on the completeness with which this is being done. However, reporting of these cases is not being uniformly carried out throughout the country. In some cities, such as New York, and in certain states, the new cases are being reported and are vigorously followed by the department of health to insure proper medical supervision for each, whether it be care in a hospital, by a private physician, or in a health department clinic.

The method by which the New York City Health Department coöperates with the Selective Service Administration with respect to diagnosing cases of syphilis was described by Dr. Rosenthal. The serologic examination required of each registrant is made by the Health Department laboratory; and a report of the examination is sent to the Bureau of Social Hygiene of the Health Department, to the U. S. Public Health Service, and to the local board examiner. One hundred and thirteen thousand serologic tests have been made on selectees in New York City, and the positives have been about 2 per cent. Every registrant found to be positive is asked to report to his nearest health department clinic, and, if he is not under medical treatment, is immediately placed under treatment at the clinic, provided he is unable otherwise to secure medical care. All positive cases are given a second serologic examination. Intensive follow-up, first by mail, and if unsuccessful by home visit, is instituted on all registrants not reporting promptly.

On the basis of information recently given him, Dr. Rosenthal reported on the prevalence of syphilis in registrants from other parts of the country. In Ohio, among white registrants, the percentage was 1.8, and among the colored, 18. In Pennsylvania, among whites 1.3 per cent were positive, and among the colored, 17 per cent. Among 120,000 men, chiefly from the north central states, there were 7 infected men per 1,000. In two groups of southern states, the positives averaged 6 per cent and 11 per cent for whites and Negroes combined.

Neither tuberculosis nor syphilis is a leading cause of rejection; however, they are infectious diseases, both of which are subject to the hope of eradication. Scientific weapons against syphilis are available; certain procedures such as hospitalization in the control of tuberculosis are generally accepted. Case finding through Selective Service examinations should furnish impetus for organization on a national scale of campaigns against these diseases.

AVAILABLE MEASURES FOR PREVENTION AND CORRECTION OF IMPORTANT
CAUSES OF REJECTION

The round table next turned to a discussion of a number of the important causes of rejections which are not reportable but represent significant health problems for which rehabilitation programs are being sought. Each disease or defect was considered with reference to measures now available for correction and to measures of prevention that are applicable to the young not yet affected.

The first condition discussed was defective teeth, and Dr. Henry Klein opened the discussion by presenting detailed data from careful mouth examinations of about 1,400 young men in West Virginia and Maryland in the age range 21 to 35 years. These men were classified according to Selective Service standards into "acceptables" and "rejectables." Dental needs found in the rejected were described as follows: 2.4 teeth per man were carious enough to require extraction; 7.6 tooth surfaces needed to be filled; and, because on the average 13 teeth have been extracted, 9 out of every 10 rejectables need full or partial dentures. The situation found at these ages, said Dr. Klein, arises from a long-continued accumulation of untreated caries which have been accruing each year since the men were about 6 years of age. A large disparity has long existed also between the rate of development of carious lesions and the rate at which these lesions have been serviced in these men. Knowledge is not sufficient for the prevention of caries, according to Dr. Klein, but procedures of dentistry are sufficient to prevent rejection for dental defects, even in men having marked caries susceptibility. With our present knowledge, a never-ending dental-servicing program is required, beginning in the first decade of life and continuing without interruption through the fourth decade or longer.

The findings in regard to dental defects naturally raised the question as to the value of a program for dental care of children after 6 years of age. It would appear that such care to be effective must be continuous; if there is a lapse, the increment of caries will exceed the increment of care. It was generally concluded that the evidence at hand did not indicate great accomplishment in the field of dental health during the past twenty years.

The discussion of prevention and correction of cardiovascular diseases was opened by Dr. Soma Weiss, who stated that it is essential to admit the limitations of our attack upon the problem. The majority of disturbances of the heart, blood vessels, and circulation are not easily prevented or cured, because most disturbances are structural, irreversible, and often degenerative, and their causes are not at present adequately understood. The greatest number of rejections in this class probably come from cases of rheumatic heart disease, arterial hypertension, and neurocirculatory asthenia.

The most hopeful approach to the problem of rheumatic heart disease lies in reducing the incidence of acute rheumatic fever and in treatment of patients with rheumatic activity. Further knowledge of its etiology is essential for an effective program of control. Studies in the large urban centers have indicated the association of rheumatic disease with overcrowding and poverty. Improvement of housing conditions, better diets, and a more healthful life would undoubtedly lower the incidence of this disease.

Arterial hypertension, said Dr. Weiss, is but a symptom of various abnormal conditions, among which one of the most important is lesions of the kidneys. Search should be made for a diagnosis of potentially curable unilateral renal disease. Considerable judgment must be used to determine the significance of moderate

hypertension, since in young adults moderate elevation under psychic stress is not unusual. The management of persons with hypertension consists of educating them in rational living in moderation. In neurocirculatory asthenia, psychic factors may play an important rôle, but the physiologic responses of the cardiovascular system and of the autonomic nervous system are congenitally suboptimal. Physical training which is slowly increased in intensity, combined with psychotherapy, can benefit these persons, but the condition usually cannot be cured. The only form of valvular heart disease which can be entirely prevented by treatment, according to Dr. Weiss, is syphilitic heart disease.

Rheumatic fever as a cause of heart disease was discussed by Dr. John R. Paul. Prevention of this disease is in its infancy, but there are encouraging signs that it may become a legitimate form of public health endeavor. According to Dr. Paul, there is already information that the rheumatic family is an important unit in the field of prevention of this disease, in the same manner as is evident in other chronic infectious diseases—namely, tuberculosis and syphilis. If a family (living in the vicinity of New York City) is chosen by virtue of the fact that one of its members (a child) is rheumatic, then the chances are that 10 per cent of the other siblings are also rheumatic. If a family is chosen because one child and one parent are rheumatic, then about 20 per cent of the other siblings will prove to be rheumatic. This indicates the importance of the family as a unit upon which preventive efforts in this disease may begin.

Another line of approach is through the schools, for this disease is one which primarily attacks individuals of school age (7–13 years), and the proper examination of school children would go far in promoting more adequate systems of case finding and more adequate contact with the rheumatic family. A *Register of rheumatic cases* is another important need.

Just how far the early rheumatic or the “pre-rheumatic” child may be safeguarded is, of course, open to question, but the preliminary reports on the use of small doses of sulfanilamide as a control measure in this disease are sufficiently interesting to warrant its further investigation as a possible public health weapon.

Prevention and correction of eye defects was discussed by Dr. H. S. Gradle. Among persons examined by Selective Service, slightly over 5 per cent are disqualified because of eye conditions. Three-fourths of these are due to defects in refraction and in vision, and less than one-fourth because of ocular disease. Refitting these individuals for service is a simple problem, provided a certain compulsory element is added. In Dr. Gradle's opinion 82 per cent of those rejected for ocular conditions can be rehabilitated. As yet, there is no way of enforcing rehabilitation and the problem of rehabilitation hinges upon the one factor as to whether it is to be voluntary or compulsory.

Dr. Gradle felt that with the enormous man power which we have to draw upon for our present army, it does not matter whether we throw three or four hundred thousand men out who might go into the service, but it does make a difference in the industrial and economic future of the country as to whether the young men of that generation will be put into the best possible physical condition.

He noted that the uncorrected visual defects increase perceptibly as age increases. For example, in a survey of about one million and a quarter children in the primary schools, defective vision was found in about 0.9 per cent of the pupils. At high-school ages, the rate was almost 2 per cent; and for the ages which are being dealt with in Selective Service examinations, the rate increased to 3.5 per cent.

It was found in the school surveys that the correction program, when undertaken, had marked effects upon the well-being of the children, and it is believed that the same will hold true in the Selective Service cases if they are rehabilitated from the visual standpoint.

Dr. A. L. Van Horn, who reported on orthopedic impairments, stated that conditions in this class accounted for 7 per cent of rejections and was exceeded only by defective teeth. Orthopedic impairments generally are the result either of accident or of disease. The diagnoses for 150,000 crippled children indicated that impairment in about 19 per cent is due to poliomyelitis, in 11 per cent to cerebral palsy, in 7 per cent to clubfoot, in 6 per cent to osteomyelitis, and in 5 per cent to flat-foot.

A large part of the severe crippling conditions resulting from poliomyelitis can be prevented in instituting proper therapeutic measures as soon as the diagnosis has been established. Recent advances have been made in the treatment of acute osteomyelitis with the newer chemotherapeutic agents which offer considerable encouragement. Early diagnosis and treatment is of extreme importance. Many congenital deformities can be effectively treated in early childhood to the point where normal function can be assured in many instances.

Flat-foot, when recognized early, may respond to certain training exercises. Mild or even moderate degrees of flat-foot are not inconsistent, however, with a proper functioning foot. Curvature of the spine, another frequent cause for rejection under the Selective Training and Service Act, can best be treated in its earliest stages. A severe or even moderate degree of deformity due to scoliosis is rarely consistent with normal function.

According to Dr. Van Horn, prevention is the only reasonable and satisfactory solution for impairments due to accidents. Elimination or control of industrial hazards will play an important part in this program. Continued emphasis must be given to traffic control, to improved highways, and to education of the public regarding the prevention of accidents.

In order to provide our armed forces with men who are physically fit and also to fill the needs in our defense industries, serious consideration should be given to a comprehensive program of physical rehabilitation whereby full utilization of our existing man power can be realized.

Special consideration should also be given to provisions for vocational training and for placement of physically handicapped persons in defense industries. More emphasis has generally been placed on the correction of the physical disability than on the elimination, in so far as possible, of the vocational handicap. Any program of physical rehabilitation without subsequent vocational training and placement of the physically handicapped fails to meet fully the needs of this group.

Dr. Currier McEwen commented that, even though arthritis has been found relatively infrequently among the men examined through Selective Service, it is, when present, a leading cause of disability. Though small in number, these cases are important also because many of them cannot be made available for military service. Dr. McEwen pointed out that the feasibility of prevention and correction of arthritic defects would depend on the nature and particular form of disease in question. In the pyogenic forms of arthritis, those due to known infectious causes, modern treatment with chemotherapeutic agents is very promising.

The mental and nervous diseases for which men are excluded from military

training run the gamut of all neurologic and psychiatric disturbances, said Dr. John Romano. As conducted in Boston, the neuropsychiatric examination is made by a psychiatrist at the induction center and each man is seen for about six minutes. It consists of an examination of the cranial nerves, reflexes, gait, coördination, Romberg, etc., and attention to signs of nervous tension and disorders. Questions are asked on history of employment, relationships to family and fellow employees, history of alcoholism, stammering, nervousness, fainting. The responses to questions usually give indication of intelligence but some few are referred for an intelligence test. Rejections have averaged from 8 to 12 per cent. The principal causes, said Dr. Romano, have been occasional neurologic disorders, limited intellectual endowment, and a third group with character disorders or psychopathic personalities associated with minor thefts and chronic alcoholism. Finally, there is the important group of neurotic individuals: fainters, stammerers, and those with pronounced nervous instability who are fertile soil for the traumatic neuroses. Dr. Romano was of the opinion that, if possible, more time should be given to the psychiatric examination in order to exclude neurotic personalities who may do poorly in military life but who may adjust to other phases of the defense program.

Though much has been accomplished by the mental hygiene movement during the past thirty years, Dr. Romano felt that there still is a great deal of work to be done in respect to popular education in the family, the school, industry, and the medical profession in order to remove the stigmatization which still exists in respect to emotional problems. It is most desirable to have an increased awareness on the part of physicians of the significance of emotional illness and of neurotic personalities with or without physical disease. Without this, the problem of prevention will remain insoluble for many years to come.

Dr. H. E. Meleney mentioned the possibilities of wider application of preventive health measures which were brought out by those participating in the discussion. He emphasized again the need for extension of present programs in the control of tuberculosis and syphilis, and the need to determine the cause of dental caries. Dr. Meleney also advocated the reporting of rheumatic fever as a public health measure.

Popular education concerning psychiatric conditions was stressed in his summary. The need for specific classification of diagnoses of these conditions which was suggested by Dr. Kenneth F. Maxcy was also noted. Dr. Meleney commented on the probability that war itself and the strain of service had been a great cause of post-war disability in persons probably normal before going through the experience. For prevention, a quick screening test and a later examination might be suitable.

POSSIBLE PLANS FOR REHABILITATION

Mr. Linton B. Swift explained the plan to establish information centers in communities throughout the country where local draft boards may send men for advice on health, personal, and family problems. The plan has been worked out by the Family Welfare Association of America in coöperation with the National Selective Service System. Local member agencies of the Welfare Association are to conduct the information centers which will direct men, rejected or deferred because of disease, physical defects, or other problems, to the health agencies, clinics, public welfare departments, and private family agencies in their community. Coöperation, Mr. Swift explained, is entirely voluntary on the part of all persons and organizations concerned.

Further information than that available in the routine operation of Selective Service is necessary, if programs of rehabilitation are to be planned wisely and if the lessons of these data are to be fully applied in shaping our future health services.

Mr. Perrott suggested an experimental project in several localities to determine:

1. The extent to which specific defects among these men might have been prevented or ameliorated if adequate health and medical services had been received during childhood and adolescence.

2. The relation of the defects to the men's civil occupations, and the possible need for vocational as well as medical rehabilitation.

3. The degree to which various defects might be remedied by appropriate medical and surgical procedures; this estimate should be made by specialists.

4. The value of an experimental rehabilitation of young men who voluntarily agree to undergo treatment. This would give information as to the practicability of a voluntary program, cost of necessary treatment, and effectiveness in improving the physical status of the young men, both from the point of view of their availability for military service and their effectiveness in civilian occupations.

It was pointed out in the group discussion that most conditions which need correction are not reportable and are by law confidential information which is not revealed except to the individual concerned.

Dr. George Baehr, in summarizing the topic of rehabilitation, said that everybody has been so impressed with the number of remediable physical disabilities among the 42 per cent of registrants who have been rejected by the combined Selective Service and Induction Boards, that the public press and our legislative officials have become conscious of the problem and of its significance. For this reason, the Health and Medical Committee, which is a part of the Federal Security Agency, and the Honorable Paul V. McNutt, Coördinator of Health, Welfare and Related Defense Activities, appointed a Commission on Physical Rehabilitation of the Rejected Registrants, of which Dr. Baehr is chairman. Three other members of the Commission—Dr. H. S. Gradle and Dr. M. T. MacEachern of Chicago, and Dr. Channing Frothingham of Boston—attended the round table conference. At a recent meeting of this Commission, it was decided to recommend that the examining physician of the local Selective Service Board and of the Induction Board, when noting a defect, should state whether in his opinion the condition is correctable. A second suggestion was that the registrant, if he wishes, should sign a statement that if a remedial defect is found he will have it corrected. This might have the effect of persuading the registrants to have something done about defects when they are discovered.

Some members of the commission feel that some compulsion is necessary. Others feel that a combination of compulsion and persuasion will be required. Some men could be inducted into the army where minor handicaps can be corrected. Whatever means is found to raise the consciousness of the people themselves concerning the magnitude of this problem and the need for action, one thing must be done—funds must be found to meet that cost. State and local agencies will meet the problem realistically only when they know the actual extent of the problem and how much such a program for correction will cost.

In considering plans for rehabilitation of rejected persons, Mr. Homer Folks made the observation that at the present time there is not much machinery available for corrective work for this particular group. In a practicable plan there must be funds to follow the man where the remedial work can be done. A

workable program must be state-wide, funds must have central allocation; this means action by the state.

The discussion of rehabilitation brought out the desirability of giving broad consideration to each individual which should include his social setting and normal environment. The mental and emotional states, the personal and social problems, and the potentialities of each individual require evaluation as well as his physical status if rehabilitation is to be economically and socially effective.

NUTRITION IN NATIONAL DEFENSE*

FRANK G. BOUDREAU, M.D., *Chairman*

HUMAN resources are the one essential to a nation's defense for which there is no "ersatz." Indeed, the success of military and production activities for defense rests heavily on the health and morale of the people. In turn, it is equally true that their health and morale depend in large part on their being well fed according to modern standards.

Investigations over the past thirty years have revealed the existence of many dietary essentials and the foods which contain them; the nation's farms can easily supply all the food required. Advances in the science of nutrition have revealed the nature of specific deficiency diseases and now, for some, even the mildest form can be detected; the specific essentials are also available in pure form as therapeutic agents. Thus, we have the knowledge and means both to correct our outstanding nutritional deficiencies and to insure good nutrition.

The Round Table on Nutrition in National Defense considered the requirements for proper feeding of the population and discussed plans for national organization and activities to promote the widest possible utilization of the science of nutrition and our vast food resources, in the larger perspective of existing conditions and activities in other liberty loving countries.

From his own survey last autumn as well as from very recent reports supplied by six other observers, Dr. Joseph Stokes, Jr., described the dietary conditions in warring and occupied countries of Europe.

In France last September an ersatz product was being used to supplement a dwindling meat supply; a shortage was impending in potatoes, vegetables, and sugar; and there was an almost complete lack of fat. The principal vitamin deficiencies were of A and the B complex.

Very recent information from Norway indicates that the population in the northern part of the country, though small in number, was undergoing particularly severe privation because lack of fuel had resulted in most of its potato crop being frozen. Elsewhere in the country, bread, sugar, and fats are rationed; milk is available only in reduced amounts; and vegetables are scarce. Although the amount of fish is sufficient, the quantity of bread and milk depends upon imports which will have to come in far larger quantities if there is not to be definite starvation very soon.

Dr. Stokes presented comparative data on daily rations in six European countries as obtained from ration cards. Denmark, Italy, and Germany are enduring less hardship from want of food than are Belgium, Holland, and France. It is estimated that the population in the latter countries is receiving at most, 1,400 to 1,500 calories a day, with the actual figure probably much closer to 1,100. Unoccupied France is said to be in somewhat more serious straits than the occupied area.

* Report of the Round Table on Nutrition in National Defense at the Nineteenth Annual Conference of the Milbank Memorial Fund.

Both Dr. Stokes and Dr. Wilbur Sawyer agreed that food shortage was severest in Spain. Those who have attempted to estimate the daily caloric intake there have put it between 800 and 900 calories for adults. And throughout the population there were marked physical signs of malnutrition.

WAR EXPANDS NUTRITION WORK IN CANADA

Describing the recent nutrition work in Canada, carried on principally by five agencies, both official and nonofficial, Dr. F. F. Tisdall stated that the program is now being pushed with greater scope and vigor than ever before. For with the outbreak of war, the need was at once recognized to expand rather than restrict nutrition activities.

Besides directing the attention of the Canadian people to the importance of nutrition through a series of public addresses by outstanding authorities, the Canadian Medical Association, with the assistance of the Life Insurance Companies in Canada, has prepared a booklet, *What to Eat to Be Healthy*, of which one and one-quarter millions have been distributed. It is now in its third printing. In conjunction with the Canadian Red Cross, the Medical Association has published another booklet, *Food for Health in Peace and War*, of which one and three-quarter million copies have already been given out and an additional three-quarters of a million are to be issued. This number will provide a copy for every home.

Indicating that research has also gone forward in Canada, Dr. Tisdall reported some results from an experimental demonstration at the Toronto General Hospital on the beneficial effects of improving the diets of pregnant women. Of 200 women attending the prenatal clinic who were found to have poor diets, 100 were given daily supplemental food which included: one egg, 30 ounces of milk, one-half ounce wheat germ, one ounce cheese, four and a half ounces of canned tomatoes, and one orange. The remaining 100 women received no supplements. The obstetricians recorded their findings for all the women and were not told which had received the supplements. In the improved-diet group, there were no miscarriages, stillbirths, or deaths of infants in the first 6 months of life; in the poor-diet group there were 13 per cent. Major complications during labor affected 17 per cent in the supplemented group as compared with 47 per cent in the poor-diet group. Postpartum complications showed similar differences in incidence and furthermore the babies showed a striking difference in their condition during the first 6 months of life.

Another type of research pertained to the analysis of foods extensively used in Canada. This work has indicated that vitamin C is not abundantly distributed in many Canadian foods. This, combined with the loss which occurs in vegetables in cold storage, suggests that vitamin C may be an important deficiency in the Canadian winter diet.

Dr. E. W. McHenry stated that the Department of Pensions and National Health, through its Council on Nutrition, has conducted nutritional surveys on low-income groups in Halifax, Quebec, and Edmonton; and on a middle-income group in Toronto. The results of the low-income surveys were entirely similar in the different cities. They pointed to three principal deficiencies: the vitamin B complex; calcium, particularly in children; and iron, particularly in women and children. It was found that the shortage of the vitamin B complex also occurred in the high-income group, although it was not as marked as in the low-income families. Calcium deficiency was present among the adolescent girls in the

high-income group. These girls were consuming very little milk because they were endeavoring to remain slender and regarded milk as a fattening food. Interestingly, enough, they were actually consuming about 20 per cent more calories than they required, most of it coming from pastry, candy, and soft drinks.

Because of the low thiamin intake revealed by those surveys, the health and agricultural authorities in Canada have been studying the production of wheats with high thiamin content and special milling processes to retain most of this vitamin.

ADEQUATE FOOD SUPPLY STRESSED IN DEFENSE WORK OF THE UNITED STATES

In the United States it is recognized by agricultural and public health officials that adequate supplies of the right kind of food are an important part of the "total" defense work in which our country is now engaged. Mr. M. L. Wilson reported to the conference on natural food supplies in their relation to a number of important government programs. Referring to the current wheat surplus in the United States and in the world, he pointed out the importance of continuing acreage adjustment of wheat. Concerning the food-for-defense program, he cited a recent important measure by the Secretary of Agriculture to stimulate the conversion of corn and feed crops into protective foods, like pork, eggs, and dairy products. The program provides for the long-term support of prices for the latter products. A program to expand production of canned tomatoes has also been announced and other commodities probably will be added to the list.

The need today, said Mr. Wilson, is for more protective foods and for getting more of these to the population as a whole. Many persons can be reached through education. But several millions of our lowest income families actually lack the buying power to get the foods they need.

For some time a surplus in farm products has been a troublesome economic problem. Accordingly, the U. S. Department of Agriculture has initiated programs enabling the underfed to consume the surplus. Mr. Wilson described one plan by which food stamps have been used to insure that the consumption of surplus foods would represent an actual net increase in food intake. Its benefits, at first restricted to those on relief, were recently extended to others receiving public assistance. The plan is now operating in 380 different areas throughout the United States.

Utilization of surplus foods in the free school lunches represents another beneficial outlet for these foods. Through the coöperation of federal, state, and civic organizations, this service is now providing at least one satisfactory meal every school day for five million children. Also, a special low-cost milk program is being tried out in six large cities. Public-aid families are able to get milk at 5 cents a quart, or free if local welfare agencies can arrange for free distribution. Supplementing the low-cost milk program, special provisions make possible the sale of milk to school children at a cent a glass.

Educational programs to stimulate farmers to have gardens and to grow more protective foods have been carried on for years by the Agricultural Extension Service. This work has been extended in the past year.

Plans for improving the nutrition of our population are progressing on a wide front. The Federal Coördinator of Health and Welfare has set up an office of nutrition as a clearing-house for the state committees on nutrition. He is advised by an important committee composed of representatives of government agencies concerned with health and nutrition. On a lower but not less important level

are the more than forty state nutrition committees which in some instances are duplicated in counties and towns.

In December, 1940, the National Research Council announced the appointment of two committees—the one on Food Habits, the other on Food and Nutrition—to advise the United States Government on nutritional aspects of national defense. The Committee on Food Habits has been hearing results from scientific studies on food habits. The Committee on Food and Nutrition has been active in matters pertaining to the public health aspects of nutrition. It has also functioned through seven subcommittees, of which three may be mentioned here: Subcommittee on Definition and Standards for a Nutritionally Satisfactory Bread, Subcommittee on Basic Concepts of Nutrition, and Subcommittee on Nutrition in Industry.

ENRICHED FLOUR AND BREAD RECOMMENDED AS NATIONAL MEASURE

After considerable study, the Subcommittee on Definition and Standards for a Nutritionally Satisfactory Bread recommended that a new flour and bread enriched in vitamins and minerals should be produced in this country. These would contain thiamin, riboflavin, nicotinic acid, possibly other ingredients of the B complex, and iron in amounts corresponding to or greater than those in stone-ground flour from high vitamin quality wheat. Although the relevant recommendations of the Food and Drug Administration defining enriched flour and bread have not yet come into force, such flour and bread have been made available by the millers and bakers almost everywhere throughout the country.

Dr. Russell M. Wilder explained the rationale underlying the recommendation on enrichment of flour and bread. For various reasons the trend in the milling industry has long been toward increasing refinement of flour with a corresponding loss in its nutritive value. But, since bread from such flour is a staple article in the American diet, indeed, represents a large part of the food of the low-income group; since its deficiencies are often not compensated by other items; and since its high starch content actually creates a drain on what little amount of the vitamin B complex there may be in the rest of the diet; the committee deemed it advisable to restore at least part of its natural nutritive properties as a means of conferring some protection on the mass of the population.

"Enriched flour" may be produced either by a change in the milling or by simple addition of the specified essentials. "Enriched bread" may be made from "enriched flour," or by the addition of the required vitamins and iron to the bakers' formulae, or by the use of special yeasts. Thus, it is not specified that enrichment need necessarily be by addition of the synthetic vitamins.

It is apparent that the "enriched" bread, eaten in the usual quantity will assist importantly in planning an adequate diet. Its use will be of most help to those who customarily rely upon bread as their main source of energy.

In view of these measures taken in behalf of the civil population, Col. Paul E. Howe was asked about the army ration. He stated that the army has been operating its messes on a money allowance based on the garrison ration; but that in May, 1941, the soldiers would begin to receive definite quantities of food corresponding to a set of monthly menus. The slight saving under this plan is to be spent for food supplements.

Dr. Lydia Roberts reviewed the work of the Subcommittee on Basic Concepts of Nutrition in its preparation and adoption of standards for various dietary essentials. In view of the lack of precise experimental evidence on the require-

ments for the several constituents, they asked many nutrition investigators for suggestions of values which had the best bases. Before their adoption the proposed allowances were submitted to the investigators for criticism. Dr. Roberts made a plea for intensive studies on the quantitative needs for the several dietary essentials so that the values might be more exactly fixed. Similarly, Dr. C. G. King urged further investigations on the amounts of the essentials contained in various foods.

The Subcommittee on Nutrition in Industry has adopted a report drawing attention to the importance of good nutrition for defense workers and recommending measures for the study and promotion of such nutrition. It was pointed out that the defense of this country rests upon defense workers concerned with production of the instruments of defense just as it rests on the effectiveness of the armed forces. Yet candidates for the armed forces are rigidly selected and given every environmental and nutritional advantage, while defense workers, many of whom have been rejected for military service, must as a rule shift for themselves. The recommendations of the subcommittee have been endorsed by the Subcommittee on Industrial Hygiene of the Health and Medical Committee of the Council on National Defense.

CORRECTION OF MALNUTRITION AMONG INDUSTRIAL WORKERS IS NEEDED

Designating it an urgent problem, Dr. V. P. Sydenstricker stressed the need for correction of existing malnutrition among the civil population, particularly the industrial workers. He pointed out that the nutritive system is labile, reacting readily to numerous adverse factors. Of these, insufficient or improper diet is the commonest. In times of plenty, the national diet is not exemplary. During economic depression, it is much inferior and presents a real problem. The result is malnutrition on a mass scale.

Furthermore, it should not be forgotten that nutritional disturbances arise from many possible causes beside improper diet. For example, most intercurrent illnesses leave their mark upon the nutritive system.

As yet, the exact amount of malnutrition cannot be stated; estimates vary from 25 to 50 per cent of the population. Even in better times it is a problem which extends through the population; for malnutrition is no respecter of age, sex, or locality. But now it has been magnified and intensified by economic circumstances of the past decade, particularly among the less fortunate. The best evidence from dietary surveys and nutritional examinations indicates that a large proportion of those who have been existing on extremely low incomes, comparable to levels provided in various forms of public assistance, have been subsisting on inferior diets and bear the unmistakable signs of malnutrition.

This malnutrition is deeply significant in this hour of industrial mobilization. As the call goes out for the unemployed to rejoin the ranks of labor, it should be recognized that many who return will show the effects of prolonged dietary deprivation and periodic illness. In the interest of efficiency, it is already appreciated that many will require a training period to regain lost skills. But efficiency is also linked with physical condition. That part of the body most profoundly affected during times of privation and therefore most urgently needing restoration is the nutritive system.

Nutritive disturbance, depending on the cause, assumes many forms. Deficiency diseases are usually multiple just as dietary deficiencies are multiple. They also appear in various degrees of severity, in which the mildest is the latent state.

There is every indication that much of the present malnutrition in this country is in this state. In the nutritive rehabilitation of persons, on a large scale, the first task is to detect the malnourished and the nature of their deficiencies. For this purpose, a battery of new methods is now available.

Once the affected persons and the nature of their deficiencies are identified, it is desirable that their nutritive system be restored as quickly as possible. Obviously, any dietary defects must be rectified. In the past, it has been thought that an adequate diet will correct any nutritive disturbance. This remains true, but it is not the whole truth. If time is no consideration, a satisfactory diet will doubtless lead to recovery; but it may not bring about complete restoration with promptness. The malnourished present pathological conditions which call for specific therapy in higher concentration than can be provided in food. In short, in addition to a satisfactory diet, concentrates are needed for rapid recovery. Once recovery is accomplished, the therapy may be withdrawn and diet relied upon for maintenance.

PLAN OF POPULAR EDUCATION IN DIET IS URGED

In discussing education in diet and nutrition, Dr. Lydia Roberts emphasized the pressing need at the present time for existing knowledge to be incorporated more widely into the living of the people. The task is to devise ways and means to speed up this process so that the population at large may profit from their rich inheritance in the results of nutrition research. The solution must come largely through a well organized plan of popular education. Dr. Roberts mentioned three aspects of such a program:

1. Translating the findings of research into everyday terms which the lay person can understand.
2. Broadcasting this knowledge in every possible means so that it reaches every person in the country.
3. Devising effective ways of motivating the common people so that they are convinced that nutrition does "make a difference," and feel the "inner urge" to put it into practice in their living.

The methods by which these ends may be accomplished were discussed under two main heads: (1) generalized education of adults and children through a variety of "shot-gun" methods, and (2) fundamental education in the schools and higher institutions of learning.

General education, said Dr. Roberts, means deliberately entering into the fields now largely usurped by commercial interests, and using them for public welfare. The time has come when some organization interested in public welfare rather than commercial profit should take over the air and broadcast sound nutrition education to the public. It should study the programs and methods of the most successful commercial broadcasts and incorporate into its own program their essential features. Other avenues of nutrition education which should be utilized are food demonstrations, adult education classes, and dissemination of nutrition facts through leaflets and posters in places where people assemble, such as grocery stores, school lunchrooms, industrial plants, relief stations, clinics, waiting rooms of railway stations, and elsewhere.

But such methods, even if effective, are only second best. Dr. Roberts felt that the real hope for improving dietary habits and nutritional status is through a fundamental program of education, especially in the public school. Few schools have effective nutrition programs, due largely to the lack of nutrition knowledge

on the part of the teachers. The greatest need at the present time, therefore, is to include education in nutrition and related health matters in every institution which trains teachers.

From the many reports and views presented at the Round Table it is apparent that, although much is being done to improve the nutrition of our people, much remains to be accomplished. The view was expressed that a well-organized national effort on a broad front to direct and coördinate the activities of the many existing agencies toward raising the nutritional level of the people and, thereby, their efficiency and vitality would enhance our national strength in the present emergency. For this the many organizations are laying plans. Their activities are expected to take fresh impetus from the National Nutrition Conference called by the President.

RESEARCH IN FACTORS INFLUENCING FERTILITY*

LOWELL J. REED, PH.D., *Chairman*

PROBLEMS of the quantity and quality of population are basic to considerations of national defense. Matters of immediate concern are numbers of males of military age, and proportions of these fit for military service. If we think in terms of permanent defenses, we inevitably give attention to the size and character of future generations, hence to the birth rate and its variations in different elements of our population.

Just at the time that this country was becoming sufficiently aroused to adopt a Selective Service Act, it was also learning from the 1940 Census returns that the numerical increase in population during 1930-1940 was smaller than that for any decade since that of the Civil War. The proportionate increase, 7.2 per cent, was by far the smallest for any ten-year period since the first census was taken in 1790.

It is, therefore, not surprising that there is increasing popular concern over the trend of the birth rate. Herein lies some danger that a hastily conceived and one-sided population policy will be demanded. Careful students realize that the problem is not amenable to simple and uniform treatment, and that much additional knowledge is needed. There are the contrasting situations of low birth rates among certain urban groups and high birth rates in rural areas, particularly in the socially neglected and economically handicapped regions of the South. Thus, for urban groups the focal problem in population policy might be that of encouraging larger families. Before this problem can be attacked with confidence, however, a better understanding is needed of the cultural and psychological factors influencing human fertility. In certain rural areas, problems of health, education, and poverty are accompaniments of high fertility; and one of the outstanding questions is the most feasible way of making family limitation available to people needing it for health or economic reasons.

The program for the Round Table on Population Studies was prepared with the above points in mind. The general topic was "Research in Factors Influencing Fertility." Reports of six research projects in varying stages of progress were presented for discussion. Those at the morning session were concerned mainly with urban problems of low fertility; those at the afternoon session centered chiefly around rural problems of high fertility.

In the first report, Professor P. K. Whelpton described the purpose and method of a coöperative study of social and psychological factors affecting fertility. This study is being made under the auspices of the Milbank Memorial Fund, with grants from the Carnegie Corporation of New York. The plans for it were developed during the past two years by a committee of ten students of population and psychology.

The study has scientific as well as immediately practical aspects. Students of

* Report of the Round Table on Population Studies at the Nineteenth Annual Conference of the Milbank Memorial Fund.

population have long stressed the need for experimental studies of motivations and attitudes regarding the voluntary regulation of family size. The type of knowledge sought in this investigation is the kind that is basic to the development of any sound program designed to exercise social influence on size of family. Among other things, the study should shed some light on the relation to size of family of such factors as the cost of rearing and educating children, the struggle to achieve a higher standard of living, the feeling of economic security, personal freedom, group conditioning, interest in religion, personal adequacy, marital adjustment, and the like.

It is evident that a study of this type necessitates the collection of detailed information of a highly personal character. Interview and questionnaire forms have been prepared during the past two years. The process of developing them has been one of formulation, testing in field trials, revision, and retesting. The final forms were recently printed and the field work is now in progress under the direction of Professor Whelpton. The interviewers are nine women carefully chosen on the basis of education, family survey experience, and other qualifications.

In view of the detailed nature of the questionnaire, the sample will be a fairly small one. It is to be restricted to 1,200 married couples in Indianapolis with the following characteristics: husband and wife native white; both Protestant; married in 1927, 1928, or 1929; residents of a city most of the time since marriage; wife under 30 and husband under 40 at marriage; neither previously married; both elementary school graduates; neither known to be sterile during most of the time since marriage. These restrictions are being imposed in order to maintain a sample which will be sufficiently large and homogeneous to permit statistical analyses of psychological data. The native-white, urban Protestant group was chosen because it is characterized by low fertility levels toward which birth rates of other population elements are believed to be approaching.

The discussion of the report went into the methodological reasons for restricting the study to the group under consideration. The hope was expressed that similar studies might be made of other population groups, in order that the urban-rural and religious influences might be more fully understood.

Through a coöperative arrangement with the United States Public Health Service, analyses of fertility data collected by the National Health Survey are being made by the Milbank Memorial Fund. A progress report on this work was presented by Dr. Clyde V. Kiser. It related to some 284,000 native-white married women of childbearing age, and considered variations in birth rates *within* as well as *between* broad social classes. Within each of four occupational groups birth rates were related to income and to education.

The report was focused on the relative importance of the various factors considered. The provisional interpretation was that birth rates of the surveyed women were more closely associated with amount of family income than with occupational class of the head, or with educational attainment of the wife. The usual tendency for birth rates to rise with lowering of occupational class was not found within specific income groups above the \$1,000 level. It was emphasized, however, that certain characteristics of the *Survey* data necessitate important qualifications regarding the closer association of birth rates to income. It was explained that, whereas the index of fertility and that of income both related to an identical period, the depression year of 1935, the occupational classification was based upon the *usual* status of the family head, regardless of his occupational or employment

status at the time of the *Survey*; and educational attainment of the wife was based upon the accomplished fact of school attendance. Hence, different results might have been secured if the index of fertility had related to total number of children ever born, or if the *Survey* had been conducted during a nondepression period.

Dr. Kiser also pointed out that since income related to the total family, certain selective factors doubtless accompanied the cross-classification by occupation and income. Available tests indicated that within groups of high and moderately high family income, lowering of occupational status was accompanied by systematic increases in proportions of families with wives gainfully employed, with relatives in residence, and with the couple constituting a secondary family. Since these selections appeared to carry with them selections with respect to low fertility, the direction of their influence would be toward the effacement of any actual inverse relation between birth rates and occupational class at high and moderately high income levels.

In the discussion it was stated that the occupational classes used in the study were possibly less homogeneous in their make-up than were the income classes, and that this might also help to account for the apparent closer association of birth rates to income. The hope was expressed that some further light on the relation of birth rates to various factors would be available from analyses based upon 1940 Census data.

Mr. Dudley Kirk, of the Office of Population Research at Princeton University, reported on a study of employment levels and birth rates, with special reference to Germany. The purpose of the study is twofold: (1) to investigate the general relationship of employment levels to birth rates in recent years, and (2) to appraise the influence of reemployment in the rise of the German birth rate since 1933.

For the first and more general purpose, indices of employment and births were compared and correlated. Detailed computations for Germany were made for the period from 1923 to 1940, and similar computations for other countries (including the United States) covered the past decade. Experimentation with the time-series technique revealed that the highest correlations were achieved by lagging births nine months behind employment. In other words, the correlation was highest when the analysis was referred to the date of conception rather than to the date of birth.

It was found that there has generally been a high correlation between employment levels and births in Germany. This was most marked in shorter periods of time, but when the secular trend of births was eliminated there was also a high correlation over the longer series. The correlation was higher in the recent periods than in the earlier ones, and was higher in the urban than in the rural regions of Germany. It was high in periods of both rising and declining employment, and there seems to be no reason for supposing that it was much greater in the latter than in the former.

In investigating the same question for a variety of countries, the correlation between employment and births was found to increase markedly with the degree of industrialization.

An interesting hypothesis developed by Mr. Kirk was that a large part of the rise in German births after 1933 was attributable to reemployment in the National Socialist "construction" program, and that reemployment was a more important factor than any specific National Socialist population policy. The changes in

employment levels and birth rates between 1932-1933 and 1938-1939 in the several countries of Western Europe demographically comparable to Germany suggested that a large increase in birth rates in Germany might well have occurred on the basis of reemployment alone.

In the discussion, Dr. David V. Glass suggested that the maintenance of a high correlation between employment and births seemed somewhat unexpected, for from the end of 1937 the initial National Socialist policy of driving women back into the home was replaced by one of encouraging the gainful employment of women. He pointed out that, although reemployment was undoubtedly very important in influencing the trend of the German birth rates, many developments of the Nazi regime had impinged on the birth rate. The more stringent enforcement of abortion laws and the suppression of birth control clinics constituted one factor. In addition, under the controlled economy, it is difficult for the ordinary family to achieve status by any other way than raising a large number of children. For the ordinary family, the alternatives between having children and spending for conspicuous consumption were now even less available than formerly. The general discussion, however, emphasized that Mr. Kirk's finding was probably a fundamental one and was not peculiar to a particular social structure. If this is true, programs directed to securing full employment may be more important in maintaining the level of the birth rate in the short run than specifically formulated population policies.

The afternoon session, devoted mainly to problems of high birth rates in the rural South, began with Dr. Rupert B. Vance's report, "The Regional Approach to the Study of High Fertility." Dr. Vance discussed the demographic and cultural factors involved in the high birth rates in the Southeast. In part, the crude birth rate in the total Southeast is higher than in the remainder of the nation because of differences in composition of the population. To what extent, then, do the people of the region have a higher birth rate because they are more rural, because they are younger, and because of their racial composition? According to Dr. Vance, these combined factors account for less than half of the excess fertility in the Southeast. In other words, over half of the area's extra fertility is due simply to the tendency of women in the area to have more children irrespective of differences in racial, rural-urban, or age composition.

A direct factor in the higher specific fertility of the region is the infrequent practice of family limitation. In this connection, however, Dr. Vance agreed with Stix and Notestein in thinking that "the situation will not be rapidly altered merely by making modern contraception available to populations that have not used the folkway methods at their disposal. There must also be the will to reduce fertility."¹

The need was therefore emphasized for studies of the culture complex of high fertility areas, of the values and attitudes of the group. It was suggested that the lack of will to reduce size of family may often be a corollary of the lack of incentive to improve level of living. The strain toward a higher standard of living is frequently cited by students as a reason for family limitation in our modern urban money economy. But the subsistence areas of the Appalachians and the "furnish and credit" system of southern tenancy areas have remained largely outside the cash nexus of our money economy. Cash costs of childbirth are small, and little is done for children. As stated by Dr. Vance, "deferred payments and do-without enter largely into the lower level of living which creeps with less evident calculation upon the growing family in subsistence areas."

Dr. Vance believed, however, that the gradual extension of high school education in these areas might serve to instill desires for a more adequate life and thus eventually furnish the motivation for restricting size of family. He also thought that a public health program devoted to the diffusion of better prenatal and obstetric care, if at all implemented in economic terms, might do much to raise standards and lower fertility among folk groups in problem areas of the South.

In the two final papers, Mr. Gilbert W. Beebe and Dr. Regine K. Stix reported on two different types of contraceptive service in southern areas of high fertility. Mr. Beebe described a three-year study among rural-nonfarm coal miners in Logan County, W. Va. Sponsored by the National Committee on Maternal Health and the Friends Service Committee, and approved by the local medical society, the service offered contraception to all married women of reproductive age. A trained public health nurse visited homes and gave contraceptive jelly to each interested woman. The service was accepted by one out of three married women, and Mr. Beebe reported that elsewhere in the Southern Appalachians an even higher rate of acceptance had been found. During the period of study the high fertility of the enlisted cases declined about 40 per cent, and it was estimated that extension of the service to all interested women might have resulted in a 20 per cent reduction in the county birth rate for a brief period.

Mr. Beebe commented on the rapidity with which patients dropped out of the series and concluded that a more successful service would require a more intensive follow-up and a variety of methods rather than a single one. He pointed out, however, that the costs of such intensive service, especially if operated independently of existing public health services, are too high to be met from public health appropriations in the Southeast, and that an unrestricted contraceptive service would be economically feasible only if integration with other public health activities permitted substantial savings, or if it were financed by other means.

Dr. Stix reported on the first three years of service of the Spartanburg County, S. C., Maternal Health Clinic, which operates under the supervision of the County Health Department in the Spartanburg General Hospital. It is a therapeutic service for patients referred by county health nurses, by physicians, or from other hospital services, because of illness contraindicating pregnancy. The clinic is operated by a physician, and while there is some flexibility in the types of contraception prescribed, the majority of patients whose records were studied were given occlusive rubber diaphragms and jelly.

Dr. Stix compared the two types of services with respect to cost, effectiveness, and acceptability. She concluded that, while the house-to-house service reached a larger proportion of the women in the area than the clinic could hope to reach, the per capita cost of the clinic service was possibly somewhat lower. She emphasized the difficulty of putting the costs on a comparable basis, but pointed out that the provision of contraception as an *additional* service in an established hospital or public health program would appear to be more economical than an independent program with relatively heavy expenses for house-to-house visits by a nurse.

Dr. Stix presented data indicating that the contraceptives prescribed for the Spartanburg patients were both more effective and more acceptable than was jelly for the Logan group. It was agreed, however, that more comparable data were needed before broad generalizations could be made.

Dr. Stix thought that with the limited funds available, subsidized contraception should perhaps be restricted to women for whom pregnancy would involve a risk to health, and should be established under direct hospital or public health supervision. She and Mr. Beebe also argued for greater attention to the needs of the individual patient and for more flexibility with respect to the types of contraception prescribed. They expressed the opinion that to terminate service with the rejection of a single prescription was to ignore the patient's continuing interest in and need for protection.

As to the more general question of the reduction of fertility in areas of population pressure, Mr. Beebe and Dr. Stix agreed with Dr. Vance that it was partly an educational problem. They suggested further that attempts be made to establish standards for commercial contraceptives and to obtain wider distribution of commercial methods at low cost in areas of high fertility.

In summary, the Round Table on Population this year did not have the general theme of a symposium. It was devoted instead to the consideration of a variety of research projects. These had in common the investigation of factors influencing human fertility. In character, they ranged from problems of trends and differences in birth rates, through studies of specific experiments in family limitation, to studies of the motivations underlying reproductive behavior; from problems of low fertility to those of regions of population pressure. I should like to emphasize that it is only through such careful and critical studies that it would be possible to formulate population policies which will be at once efficient and consonant with the fundamental values of our society.

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PUBLIC HEALTH BALLOONS

THIS is not an editorial on the late Wade Hampton Frost, but a discussion of one of his mental characteristics which, we believe, it is highly desirable to perpetuate in the search for and development of principles of public health administration. In a long personal and professional association with Dr. Frost we noted, time and again, a mental and even a physical restlessness in him whenever he confronted whatever presented the earmarks of an unattached fact. By "unattached" is meant some apparently sound observation without known relationships: an unmoored conclusion, floating in space; a sort of toy balloon bumping against the ceiling, with its string dangling just out of reach. Faced with such a situation, Dr. Frost would pace the floor. He would look out the window, return to his desk, take off or put on his glasses, gaze into space, light a cigarette. For the time being, all other things must wait, for they were relatively unimportant until proper disposition was made of this disturbing matter. For him the problem could be settled only in one of two ways: the balloon must either be punctured or moored. If it arose because of hot air, then heaven help its launcher. If it floated merely because present knowledge was not tall enough to grasp the dangling string and tie it into basic facts, Dr. Frost reached for and usually grasped that string.

It seems to us that this quality of Dr. Frost was as distinct as is genius in music or painting or mathematics. Because it was a natural gift, his analytic and synthetic approach to problems was as inevitable and effortless as cause and effect. He could no more have thought sloppily than can loose minds think straight. Now, though in public health the majority of minds are not the instruments of precision of a Frost, few of them are poor; and while only a small fraction of these minds will naturally click and mesh their observations as naturally as would a duck swim, most of them, with a little self discipline and practice, can make this search for principles and relationships nearly an automatic process. To a great extent it was the ability to inspire his students along these lines that made Dr. Frost such a good teacher. They sensed, from continuing association, that here was a master mind at work. They saw the beautiful and satisfying

results of testing and weighing observations, of detecting and discarding the false, of marshalling and synthesizing items found to be valid.

Today, more than ever, we need a renaissance of straight thinking in public health work. Wishes are becoming quite lustful about fathering thoughts, and opportunism is trying desperately to put an edge on a lot of very dull axes. As never before, the peoples of the world, particularly in the western hemisphere, are asking for that guidance which, in the face of surrounding threats, will preserve the public health. But, as always, there is a danger that enthusiasts, usually sincere but often fuzzy-minded, will gain the ear or interest of strongly placed political leaders, and put on a selling campaign for these loose toy balloons of public health. That lots of such unmoored activities are bobbing and bumping against the ceiling of public health practice is evidenced by the fact that not only have we gone beyond administrators and to liaison officers, but we are rapidly passing on to "coördinators."

ATTEND THE ATLANTIC CITY MEETING

READERS of the JOURNAL will have noted that increasingly in the past few months, more and more space has been devoted to the Seventieth Annual Meeting of the Association. Members have wanted details as to this or that, and good publicity practice has demanded an increased tempo as the time approaches for the meeting itself.

All of this is quite obvious, routine and proper. It makes things easier for the old members who, in October, will go to Atlantic City as a matter of course. Through such advance information they get a preview of what is to be offered and have the opportunity to re-savor, as it were, the benefits and pleasures of past meetings. But, actually, these old customers do not need much persuading about an Annual Meeting of the Association. They know they will get their money's worth, and about all that is necessary in their case is to tell them where and when. With the newer members, however, and even those who have been members for some time but have never been to a meeting, it is very necessary to make every effort to have them develop enthusiasm and reach a decision to go to meetings. Attendance by this group would, of course, tend indirectly to strengthen Association sinews. But more important from the standpoint of the individual are the direct benefits that would accrue to him or her personally and professionally. Giant problems, giant forces, giant minds are today stirring in public health. Rumblings of epidemics and deficiencies come from the war zones. Menaces, some actual others only potential as yet, shadow the health of people now living in a precarious peace. Controlled observation in the field, and the workbenches of science are making more precise the control of disease. As nowhere else in the world today, the Seventieth Annual Meeting will report and discuss these matters in their public health relationships.

One cannot question the value of this kind of information. It is of interest and importance to all engaged in this field; it is vitally necessary to those who have just embarked upon a public career, and it provides an opportunity for quick orientation of those who because of the specialized routinism of their work or remoteness of location, have not kept closely in touch with recent developments. And then there are additional reasons why the youngster in public health should go to Association meetings. These come under the generic heading of "broaden-

ing influences." He learns that there are perspectives, problems and practices other than his own, and she does the same. Boston discovers Los Angeles, and a southerner is amazed to learn that, without operating through county units, New England health departments do good work. The young nurse wonders where, and perhaps why, this nationally known nursing supervisor got that hat. One hears the lions of public health roar, and finds them better—or worse—than rumored. The young man and young woman make new friends in their own generation and in one way or another are brought to the attention of those whose interest might be helpful in future. We know of many a better job or increased opportunity precipitated by what at the time appeared to be casual Association contacts. We think particularly of one young chap who borrowed the money to attend a meeting and lived happily ever after.

Support your Government in this national emergency. Build a wall of defense by buying Defense Savings Bonds and Stamps.

—Buy Defense Bonds and Stamps—

Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

HEALTH EDUCATION IN ACTION

Political campaigners, ever alert to new ways of swaying the electorate, discovered some time ago that oratory plus hill-billy music was a winning combination at the ballot box. Health educators have likewise been quick to adopt fresh technics to make the public stop, look, and listen to health messages. It was our guess, however, that hill-billy music and health education would always remain poles apart despite the proven influence of such renditions as "Please Pass the Biscuits, Pappy" on the public of at least one great state.

Yet, it has happened. Hill-billy tunes have come into their own on health education programs! From the American Social Hygiene Association comes news of a series of meetings recently held in twelve villages located in the coal mining districts of West Virginia. These gatherings, organized to spread information about venereal disease, were arranged to fit as closely as possible into the accepted pattern of community life. The A.S.H.A. Field Representative knew that hill-billy music always lured local audiences when other attractions failed. So the programs designed to spread venereal disease information were opened with native tunes played by local boys. Following this "curtain raiser," A.S.H.A. films were shown, short talks were given by local

health officials, and venereal disease literature was distributed.

These programs were most successful—churches, school houses, and village halls being filled to capacity. In one locality the entire congregation of a "revival meeting" asked to attend one of the meetings with the proviso, however, that the minister would be permitted to deliver his sermon at the close of the health program! We doubt if any other health program ever offered such an array of attractions: a hill-billy band, motion pictures, a lecture, free literature, and a sermon!

(The editors of "Credit Lines" regard this as an unusual and interesting project in health education. We would like to have news of similar undertakings for publication. Send us accounts of any programs you have sponsored in which unusual or novel methods were used to "get across" a health message.)

NOTES ON HEALTH PUBLICATIONS

"ABOUT TUBERCULOSIS," just offered to health and social agencies by the Life Conservation Service of the John Hancock Mutual Life Insurance Company, is an attractive and up-to-date publication which condenses essential lay information about the disease into 15 pages. That, in itself, is an achievement in view of the complexity of the subject. The publication presents in simple language and with appropriate emphasis, accurate and understandable

Please address samples of printed matter, comments, or other editorial contributions to the editors at One Madison Avenue, New York, N. Y.

statements with reference to diagnostic measures such as the tuberculin test and the use of the x-ray, and gives due stress to the dangers of contact infection, the importance of the sanatorium in treatment, and the part which all must play if tuberculosis is to be finally conquered. The publication was developed with the help of the National Tuberculosis Association and a committee of the American Trudeau Society.

The booklet is attractively illustrated and will be a timely contribution to lay education. Copies may be secured from the Life Conservation Service of the John Hancock Mutual Life Insurance Company, Boston, Massachusetts.

There has come to our attention recently a descriptive brochure outlining a prepaid medical service plan approved by and affiliated with the Oregon State Medical Society. The fundamental purpose of the plan, according to the brochure, is to enable low-wage industrial and commercial groups whose annual incomes do not reach a recognized "comfort" level to obtain annual medical and hospital services by the payment of monthly fees through their employers. The services are on a group basis and are not available to individuals. The cost to the subscriber is approximately \$2 a month. At the beginning of 1940, approximately 30,000 employees, representing hundreds of industries in Oregon, had been enrolled as subscribers. Copies of the brochure may be obtained through the Oregon State Medical Society, Portland, Ore. (For full details on a great variety of projects and activities in this field, the reader is reminded of the new and very excellent quarterly, *Medical Care*, with editorial offices at 1790 Broadway, New York, N. Y.)

The Health Council of Cleveland, Ohio, has prepared for distribution to young men undergoing physical ex-

aminations for the armed forces, a "vest pocket" booklet covering subjects of especial concern to those rejected because of physical defects. Succinct information regarding proper food selection and good food habits, the necessity for dental care, facts about tuberculosis, venereal disease, and mental hygiene is set forth in a clear, matter-of-fact way that will help rejected young men to understand why they did not "pass" their physical examinations and what steps can be taken to insure a healthy, happy future. The section on mental hygiene is particularly well phrased. Young men will readily take "to heart" the advice that is given on this subject, which has seldom been expressed so adroitly.

Health departments, voluntary health and social agencies, and committees that are now endeavoring to meet the problem of the physically rejected draftee, in coöperation with federal agencies, and particularly with the Committee on Physical Rehabilitation, of which Dr. George Baehr is chairman, would find it advantageous to examine this publication from the Cleveland Health Council. Copies may be had by writing to the Council at 1001 Huron Road, Cleveland, Ohio.

"Are You Fit for the Job?" is the title of a publication prepared by the National Federation of Business and Professional Women's Clubs, Inc. This booklet was designed to interpret the annual physical examination to members of this large organization and to encourage them to adopt habits and attitudes necessary to attain optimal health. A complete health appraisal form is included in the booklet which the individual may use as a guide in evaluating and raising personal health standards. A health examination record is also supplied with the booklet for the use of private physicians consulted by members of the clubs. This publication

should be quite effective in stimulating an interest in health conservation and physical examinations among the group of women to whom it is addressed. Copies, at a cost of 10 cents each, may be secured by writing the National Federation of Business and Professional Women's Clubs, Inc., 1819 Broadway, New York, N. Y.

Annual reports for 1940-1941 continue to come from various agencies. Worthy of recognition here are those of the National Committee for Mental Hygiene, Inc., and the Cleveland Health Museum. The report of the former is aptly entitled "Finding a Way in Mental Hygiene." An imaginative and artistic cover designed to carry out the general theme of the report is one of the features gracing this publication. The text emphasizes current problems in the mental hygiene field including "the dismal failure of state authorities in many parts of the country to provide adequately for the mentally ill." Progress of psychiatric research is discussed with special reference to "the promising results of the newer forms of treatment for dementia praecox, such as insulin and metrazol shock therapy." The report adds, however, that researches in psychiatry are long-range problems and that early spectacular results are not anticipated though findings to date have been significant. Of especial interest to health workers is a section of the report dealing with mental health of teachers and the teaching of mental hygiene to school children. In sum, here is a stimulating summary of an organization's efforts "to find a way" in a field where progress is slow. We hope many contributors will see to it that funds "find a way" to this organization's treasury, for its work is worthy of widespread financial support.

Dr. Bruno Gebhardt, director of the

Cleveland Health Museum, can always be depended upon to present printed material in an unusual and arresting manner. The Museum's 1940-1941 report is of many colors—like Joseph's coat—and it catches the eye. A record of the Museum's history and activities to date is presented under the title "Laying the Foundation." Text, charts, and graphs are multigraphed on colored sheets of paper—blue, gray, yellow, red, and green—and the rainbow effect arrests ones attention more quickly than would a uniform presentation. The usefulness of the Cleveland Museum of Health and its acceptance by the public are convincingly set forth in the 1940-1941 report.

NEW FILMS

Health officials have long needed a motion picture for lay groups covering the clinical aspects of syphilis. The difficulties involved in preparing a film on this subject for mixed audiences are readily apparent. The American Social Hygiene Association has, however, bridged this gap successfully in the association's newest picture entitled "Plain Facts." The first half of the film describes syphilis. Actual cases are shown, the dangerous nature of the disease is stressed, and facts concerning diagnosis, treatment, and cure are explained. The second half of the film tells the story of gonorrhea by bringing out the same points of emphasis. The film is well coordinated and the narration, written and spoken by Dr. Walter Clarke, is excellently handled from the standpoint of content and delivery. This film should have a wide audience among industrial workers, school and college groups, and health assemblies. "Plain Facts" is one reel in length and is available in both 35 mm. and 16 mm. prints. Information concerning rental rates may be secured from the Association, 1790 Broadway, New York, N. Y.

"Another to Conquer" is the title of the National Tuberculosis Association's newest motion picture, scheduled for release in October. The film is designed primarily for Indian audiences, and tells the story of the new enemy which the American Indian faces—tuberculosis. The appeal of the film, however, will not be so limited. It will be prized by all people for its faithful portrayal of a cross-section of Indian life. Youngsters will like its western atmosphere with its dare-devil riding, alluring open spaces, sheep round-ups, and Indian dances. The facts about tuberculosis are necessary parts of the story—not merely morsels of cold information thrown into an otherwise romantic tale, according to the National Tuberculosis Association. The film was made on the Navajo Reservation in Arizona in coöperation with the U. S. Office of Indian Affairs and with the aid of the staff of the Navajo Service. The cast is made up of real Indians, with the exception of Dr. W. W. Peter, who gives a superb portrayal of the doctor. The photography is splendid.

"Another to Conquer" runs approximately 20 minutes and will be available in 16 mm. and 35 mm. prints after release in October.

A HELPING HAND

Among the front rank fighters in the venereal disease campaign sponsored by the U. S. Public Health Service and the American Social Hygiene Association are the pharmacists of the nation. According to officials directing the campaign, the great majority of pharmacists have readily coöperated and have made a very significant contribution to the general venereal disease education program. The men behind the prescription counters have demonstrated their sense of professional responsibility in this campaign. Window displays have been arranged, literature has been distributed, and pharmaceutical publications have

carried articles urging druggists to lend full support to anti-venereal activities.

The attitude of the pharmaceutical profession toward the venereal disease control program is expressed in the May, 1941, issue of the *Journal of the American Pharmaceutical Association* as follows:

Certainly the minimum degree of coöperation that any pharmacist can furnish is to give competent advice to those who come to him for information. Giving competent advice to the sufferer from syphilis or gonorrhea means (1) refusing to sell him any quack remedies for its "treatment," (2) discouraging him from going to see any quack doctor who advertises quick cures for venereal diseases, (3) impressing him with the seriousness of these diseases but pointing out that they *can* be cured through competent treatment, (4) urging him to consult a dependable physician for treatment.

No pharmacist can do less, but many will wish to do more.

We have to make good (in this undertaking). If you have not already done so, rid your pharmacy of venereal disease nostrums. Be proud of the fact that you stock no product for the self-medication of syphilis or gonorrhea. Obtain a supply of educational leaflets from your local or state board of health and give them a prominent spot on your counter.

The splendid support which pharmacists have given this public health activity has proved beyond doubt that the corner drug store can function as a vital coöperating unit in public health activities.

A PUBLICITY GUIDE

Advice on how to achieve publicity for health activities has been plentiful, but seldom has this advice come from expert sources. Now, however, an authority on all types of publicity has published a book which health educators should keep within easy reach whenever publicity campaigns are under way. The book is entitled "Profitable Publicity—How to Do It, How to Get It," and the author is Henry F. Woods, Jr.

Do you want to know how to write

news releases that appeal to the average man? Would you like "tips" on how to secure the coöperation of editors and reporters? Would you like to know the best way to arouse interest in health news? Mr. Woods answers these questions and many more in his volume. This book was designed to provide a thorough knowledge of the basic factors in effective and successful publicity work. It is very practical in its approach and clearly outlines the technic and methods by which desired results may be obtained through publicity.

Of especial interest to those charged with health publicity are the sections of the book pertaining to the use of statistics, the plan which publicity releases should follow to insure newspaper acceptance, the proper use of pictures, and the method of measuring publicity results.

This book might well be termed "a liberal education in the field of publicity." It covers essential phases of the subject fully and directly. You will not regret owning a copy of *Profitable Publicity*, published by Dorset House, Inc., New York, N. Y., at \$2.50 a copy.

THE DOCTOR AND YOU

The Medical Book Department of Harper and Brothers has issued the first booklets in its "Help Your Doctor to Help You" series. While the subjects to date, such as Colitis, Gastric and Duodenal Ulcer, and Gallstones and Diseases of the Gallbladder, deal with various diseases outside the realm of public health as we ordinarily think of it, these booklets will be of interest to health educators as they are models of simplified scientific writing. Every practitioner has patients who seek answers to endless questions when told that they have this or that disease. Often the physician does not have time to answer these questions to the patient's satisfaction and sometimes he simply cannot answer questions in terms

that the patient comprehends. The Harper booklets are planned to fill this need, and they are indeed a valuable addition to the growing library of books designed to give the layman an intelligent understanding of disease and health problems. The booklets are prepared under the editorship of a board of recognized medical authorities. Information concerning the series may be secured from Harper and Brothers, 49 East 33rd Street, New York, N. Y. The price of each volume is 95 cents. The publishers emphasize that the booklets are *in no way* intended to take the place of the physician and his advice.

HOW TO MAKE MONEY

Voluntary health organizations are sometimes faced with finding ways and means of raising additional money when the annual appeal for contributions falls short of expectations. A novel way of procuring such financial support was recently devised by the Waltham, Mass., District Nursing Association. The scheme of the association is one that might be followed to advantage elsewhere.

Waltham is a historic community where many of the old original homes, schools, churches, and taverns still stand. The Nursing Association drew upon this historic background as a theme for a pictorial map of the community which shows structures that date as far back as 1733. Old Indian trails and the location where certain historic events took place are also designated. The association offered this map for sale at 10 cents a copy. It is such an attractive item that it should have found many buyers.

Most people like pictorial maps, but it is infrequent that such maps of one's home community are available. We believe other voluntary health associations in need of funds might take a profitable cue from the Waltham Nursing Association.

WHAT'S A WORKSHOP?

From health educators pursuing graduate study during the summer come enthusiastic reports of a new plan of instruction designated by the term "Workshop." Under this modern system of learning, rigid adherence to fixed schedules of lectures, classes, assignments, etc., has been abandoned and students are left more or less "on their own" to delve into problems arising out of their experiences. Those who have witnessed workshops in progress and those who have attended them unanimously agree that this form of instruction is far more dynamic and practical than the accepted system of formal lectures, etc.

The philosophy and spirit of a typical workshop are well expressed in the following excerpt from a university bulletin:

The Workshop differs from the conventional graduate course in a number of ways. There will be no lectures, no quiz sections, no examinations. The members of the staff have no syllabi to hand out. There is no set "ground to be covered." The "course of study" will develop out of problems which you—participants in the Workshop—have indicated as important for you. The purpose of the Workshop is to assist you to achieve progress in their solution and to see their relationships with larger problems. . . . To this end, the staff—a group of consultants with varied backgrounds and interests—will be available for conference individually and with groups of similar interest. In so far as resources permit, books and other published materials will be available in the building. The use of your time will be for you to determine. In order to conserve your time and that of the staff, a schedule of activities for the first few days is suggested. This is tentative and flexible. It may be changed if you desire.

A successful example of a workshop in the area of health education was held this summer under the direction of Miss Vivian Drenckhohn, Lecturer in Health Education, University of Michigan. The accomplishments of this workshop proved conclusively that the workshop

system is a "natural" for graduate instruction in health education. Other universities and colleges—please copy!

MAGAZINE ARTICLES

"Life Begins with Vitamins." William L. Laurence. *Ladies' Home Journal*. July, 1941.

"Sunlight Cancer." James Ewing, M.D. *Ladies' Home Journal*. July, 1941.

"Diabetes in Your Family." Louise Fox Connell. *You Magazine*. July, 1941.

"In Case of Dogbite." Dorothea Dunlea. *Parents' Magazine*. August, 1941.

"What You Should Know About Children's Diseases." Morris Fishbein, M.D. *Parents' Magazine*. August, 1941.

"Let Them Eat Cream." J. D. Ratcliff. *Collier's Magazine*. August 2, 1941.

"Science Challenges the Master Killer." Paul de Kruif. *The Readers' Digest*. August, 1941.

"But Health Insurance Is Different." Nathan Sinai. *Harper's Magazine*. August, 1941.

"The Patient Comes First." Miles Atkinson. *Atlantic Monthly*. August, 1941.

SOME NOTES AND QUOTES

A new word has been added to the vocabulary of health education by Horace H. Hughes, Director of Public Information, Maternity Center Association, New York, N. Y. In a recent address, Mr. Hughes warned health workers to watch out for "snarks" when writing for or speaking to lay audiences. A "snark," Mr. Hughes explains, is a word or an idea which may be completely understandable to professional public health workers, but is not clear to those who have not been initiated into the mysteries of public health lingo. Watch out for "snarks," warns Mr.

Hughes, for they are the fifth columnists of health education! . . . Statistical note: Before the Social Security Act became a law in 1935, we had 762 counties with full-time health departments. We now have 1,577 . . . Have you heard the stirring medical and health dramatizations on the weekly radio program "Cavalcade of America"? A recent script dealt with spotted fever and the heroic efforts of representatives of the U. S. Public Health Service to control this disease. Another recent dramatization was entitled "The Story of Dr. S. Josephine Baker." This program told of Dr. Baker's early experiences as a health inspector in New York's tenement districts, her efforts to establish the first Bureau of Child Hygiene, and her contact with Mary Mallon, the famed "Typhoid Mary." Here's a line from the script worth quoting: "I have continued the fight for better health conditions for mothers and babies because I believe children are the most important people in the world!" The "Cavalcade of America" program is presented by NBC every Monday evening. . . . A Chicago movie theater proudly proclaims in its advertising copy that all patrons who attend its performances will be given a supply of the theater's newly discovered "Vitamin R." The ingredients of "Vitamin R": relaxation, refreshment, revitaliza-

tion! . . . We always get a "lift" out of the *Health Officer's News Digest*, a monthly publication of the Public Health Committee of the Cup and Container Institute, 1790 Broadway, New York, N. Y. It is offered free to health workers. Don't miss this snappy little journal. . . . New York's Museum of Modern Art offers the following pointers to distinguish a good poster from a poor one: (1) Ingenious and imaginative use of material as opposed to banal realism, (2) Clarity and simplicity of arrangement as opposed to cluttered designs, (3) Quality of craftsmanship in design as opposed to dependence on copy and slogans, (4) Appropriate and appealing use of color. . . . A quote from Dr. Paul F. Lazarsfeld's book, *Radio and the Printed Page*:

The United States points with pride to its small and declining illiteracy rate. But at the same time science makes such rapid progress that the proportion of what a person does not know to what he knows is probably much greater nowadays than it was when very few knew how to write or to read. In fact, if literacy is defined as competence to understand the problems confronting us, there is ground for suggesting that we are becoming progressively illiterate today in handling life's options.

A quote from the Honorable Winston Churchill: "There is no more far-reaching investment for a nation than to put milk, food, and education into young children."

BOOKS AND REPORTS

Approved Laboratory Technic, Clinical, Pathological, Bacteriological, Mycological, Parasitological, Serological, Biochemical and Histological—By John A. Kolmer and Fred Boerner. (3rd ed.) New York: Appleton-Century, 1941. 921 pp. Price, \$8.00.

The title of this book has the word "Approved" to indicate that the descriptions of methods are approved by five persons who are members of the Society of Clinical Pathologists. The book was prepared with the aid of 28 collaborators, most of them well known in their respective fields. The Approved Laboratory Technic has been very widely used since its first edition in 1931 as a very comprehensive manual of laboratory methods. The third edition has five sections and an appendix.

It contains a section of general laboratory methods dealing with the microscope, housing, feeding, inoculating, bleeding and autopsying animals, and diagnosis of animal diseases.

The second section describes clinical pathological methods, devoting 262 pages to this subject. Bacteriological methods are given in the third section which also includes diagnostic mycological methods and procedures to examine the skin and mucocutaneous membranes for animal parasites.

In this section we find three chapters of particular interest to the public health laboratory worker, namely chapters on the bacteriological examination of milk, water, and the testing of disinfectants.

The fourth section, entitled serological methods deals with the technic of agglutination, precipitation, sero-

logical tests for syphilis, blood grouping, complement-fixation test with various antigens; it includes the description of the lyophile process and also methods for conducting tests for allergy.

The fifth section is chemical and describes methods for the chemical analysis of blood, determination of basal metabolic rate, toxicological methods, histological technic, and includes a chapter on the chemical analysis of milk and other foods.

The Appendix, 26 pages, deals with a variety of subjects: paroxysmal hemoglobinuria, prothrombin determination, examination of semen, liver function tests, determination of serum lipase, the simplified Kolmer complement-fixation test, the Eagle modification of the Wassermann test, determination of vitamin C, methods for the determination of various sulfonamide drugs in the blood and urine, and a method for the determination of thiocyanates in the blood.

The methods, on the whole, are well selected; their description is clear and easy to follow. The book is profusely and well illustrated but some of the pictures are too elementary or trivial, recalling supply catalogues. Colored plates of blood cells and pictures of crystals of sulfonamide drugs in the urine are lacking. References are very scant. The interpretation of findings would have made the book more interesting and useful.

The third edition (1941) differs from the second one (1938) only by the addition of 26 pages in the form of an appendix. Thus, due to the rapid progress in the field of laboratory

methods, many parts of the book are out of date in 1941. The public health worker will find the part dealing with the typing of pneumococci slightly obsolete and will find no phosphatase test in the section for examination of milk. Nevertheless the book will remain, what it was, a very useful and comprehensive manual of laboratory methods. A reprint of the Appendix would be sufficient for those who have the second edition. JULES FREUND

When Children Ask—By Marguerite Harmon Bro. Chicago: Willett, Clark, & Co., 1940. 267 pp. Price, \$2.00.

Probably one of the most vexing problems which confront parents in bringing up their children is that of answering their many questions. "What happens when people die?" "Where do babies come from?" "Do you believe in the Bible?" These and many other questions which children ask are treated in this book in a sane, understanding manner by Marguerite Bro, herself the mother of four children who have confronted her with many bewildering queries.

Mrs. Bro feels that "questions are the child's growing edge," that they are a gateway to his knowledge about life, and that much hinges upon whether adults answer them wisely and well. Besides having four of her own children, she has taught school and has wide experience as a consultant and lecturer to boys and girls in high school and college.

The book should be enlightening and helpful to parents. ETHEL GORDON

British Cities at War—A report by James L. Sundquist for the American Municipal Association. Publication No. 76, 1941. Chicago: Public Administration Service. 110 pp. Price, \$1.00.

That public health administrators are

hungry for reliable information about their responsibility in a military emergency is apparent. The report of the National Technological Committee (*A.J.P.H.*, June, page 663) has been available now for two months and has been widely read. This present report is more extensive and is up to the minute, including some reports dated less than a month before its publication.

Although the section on public health is not a conspicuous part of this volume, a reader will readily appreciate the fact that in Great Britain an enormous responsibility has been heaped upon the health authorities during the emergency and that their new responsibility has included tasks unfamiliar to their American colleagues.

This report is believed to be the most comprehensive of its kind now available. It is an absorbing account of the effects of active warfare on British cities and shows how their local defense arrangement and their ordinary services have worked in a great crisis.

R. M. ATWATER

Health Education. (2nd revision.) Report of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association with the coöperation of Advisory Committee. Washington, D. C.: National Education Association, 1941. 368 pp. Price, \$1.50.

Prepared primarily as a guide for teachers in elementary and secondary schools and institutions for teacher education, this volume supplies from numerous sources an authoritative compilation of technical statements and a consensus of professional opinions relative to health education.

Following a foreword, an impressive list of committee members, and statements of aims and definitions of health education, are twelve chapters packed with information clearly presented.

Subjects include: child growth and development, health protection, health guidance, plans and policies of school administration, learning situations—processes of meeting them, activities and materials, and teacher preparation. Valuable features are illustrative units of work contributed by teachers and supervisors representing a wide geographical range, and 50 pages of bibliography, including references to source material.

The Joint Committee has rendered another significant service in the preparation of this up-to-date handbook which should be of assistance to many professional and lay groups, especially to those interested in education and in public health. Anyone engaged in health education should have a copy near at hand.

IRA V. HISCOCK

Fundamentals of Administration for Schools of Nursing—*Report of Committee to Study Administration in Schools of Nursing. New York: National League of Nursing Education, 1940. 270 pp. Price, \$2.50.*

The increasing necessity for coming to grips with the longstanding complex financial problems of hospitals and schools of nursing as well as those related to other types of educational institutions and projects has been developing a demand for clarification of the principles of organization and administration and their application to schools of nursing. Therefore, the publication of this book is timely.

In the foreword we are told this report is not a manual or textbook on administration but rather that it is expected to aid in developing a philosophy of administration which will stand in good stead when coping with the administrative problems inherent within the school of nursing itself. The committee which prepared the report states that it wishes to emphasize the need for understanding the nature of healthy

administration and its application to the individual school before attempting diagnosis and treatment of ailments.

The Summary (Part III), both lucid and well organized, contributes quite a deal to this needed understanding. Part I, containing a discussion of the purpose and functions of schools in general and also in relation to the school of nursing, as well as Part II dealing with an analysis of administrative functions in schools of nursing, touch upon many matters which those responsible for these schools and their administration need to understand thoroughly. Chapters X, XI, and XII on business administration and principles of organization will be found particularly helpful. Administration in relation to curriculum planning, teaching, selection and welfare of personnel and students are also covered.

Unfortunately throughout Parts I and II there is a handicapping lack of directness and simplicity in the arrangement of subject matter. Involved phraseology and verbosity make it difficult for the reader to grasp concepts with ease and clarity. It is hoped these factors will not deter those concerned with administration of our schools of nursing from making a careful study of the report. Because of its very nature this work merits close attention. Not infrequently, embarking upon the study of a subject which needs thought and clarification, results in the production of further literature dealing with its various aspects. We trust this report will have such an effect. A good bibliography provides suggestions for further reading and study.

We cannot close our comments without complimenting the publishers. It is seldom one comes across a book of this size which can be handled with such ease. The choice of paper, the type, size of page, and other details are admirable.

KATHARINE G. AMBERSON

Help Your Doctor to Help You Series:

Gastric or Duodenal Ulcer. 53 pp.

Colitis. 30 pp.

Gallstones and Diseases of the Gallbladder. 41 pp.

Migraine. 37 pp.

Food Allergy. 50 pp.

New York: Harper, 1941. Price, \$.95 each.

These are five of a longer series of booklets prepared under the auspices of an editorial board of distinguished physicians "with the idea of supplying answers to those questions that come crowding into the mind of a man or woman who has just been told by a physician that he or she has a certain disease." How much *ought* a patient to know about the methods of diagnosing food allergy or gallstones, about the meaning of various symptoms, and about alternative methods of treatment? And suppose he buys the book on colitis or the one on ulcers because he suspects that this is his diagnosis, without having been to a physician?

Such booklets can, at most, give some detailed pathological information. They cannot supply the background of general physiological knowledge without which the reader, especially when stimulated by anxiety about his own aches and pains, may draw surprisingly incorrect inferences. The stated purpose to "help your doctor to help you" assumes that the patient *has* a doctor. If he has, and if the doctor receives kindly the sort of questioning which these books are likely to stimulate, both halves of the medical pair will probably be benefited. But if the patient who suffers from headaches, or who has pains which seem like those of a friend who had a gallbladder operation, buys the appropriate book as a substitute for the presumably more expensive course of treatment with a doctor—what then?

Recognizing their disadvantages, these authoritatively prepared booklets will have some usefulness. Whether, as the preface hopes, they will be substitutes for the big old-fashioned "Home Doctor Book" is doubtful. They tell much more than such compendia generally do and are written for better informed and sophisticated persons. A strictly logical mind would urge that they be sold only on a doctor's prescription. But who, in an arsenal of democracy, would propose thus to limit the freedom of the printing press?

MICHAEL M. DAVIS

Public Health and Hygiene—By Charles F. Bolduan, M.D., and Nils W. Bolduan, M.D. (3rd ed.) Philadelphia: Saunders, 1941. 497 pp. Price, \$3.00.

This is a well printed, compact text which covers a surprising range in the 357 pages devoted to discussion. The material is presented clearly, concisely, and with scientific accuracy.

In certain instances, however, the presentation is too much abbreviated for adequate handling of the subject. For example, on page 57 more definite warning should be given against the hazards involved in the use of hydrogen cyanide and carbon bisulfide as fumigants for the destruction of insects and vermin. Furthermore, it is not clear why the reader should be told how to remove fleas from animals dead of suspected plague. If discussed at all, it would seem more appropriate to give instructions as to the method of disposing of such animals and their fleas with safety.

On page 81 occurs the statement, "careful autopsy examinations have shown that there is hardly a person over thirty years of age who does not show signs of once having harbored tubercle bacilli in his body." The results of tens of thousands of Mantoux tests in young adults should outweigh the rela-

tively meager evidence on this point afforded by autopsies made many years ago. If negative Mantoux tests have the significance ascribed to them on page 84, it must be concluded that in many parts of this country the majority of individuals have not been in effective contact with tubercle bacilli prior to attaining the age of 30 years.

On page 89 we are told that "it is important to bear in mind that the ordinary milk supply is frequently contaminated with tubercle bacilli derived from tuberculous cows." The text being intended for use primarily in the United States, the term "frequently" needs some clarification, reflecting the fact that less than 0.5 per cent of all cattle tested in the United States react positively to tuberculin. This important point is not mentioned, the sole preventive measure discussed being pasteurization. Valuable as pasteurization is, it is too much to hope for its perfect operation at all times so that the elimination of reactors from dairy herds is a definite, logical, and important accessory factor of safety.

On page 340 the calculations used to illustrate the arithmetic method of estimating populations in the intercensal years are based upon the assumption that exactly ten years intervenes between federal censuses. In the years selected, however, this was not the case, the federal census being referred to the dates April 15, 1910, and January 1, 1920. The intervening period was sufficiently less than ten years to invalidate the estimated annual increase in population used in compiling the table on that page. Although these particular census dates are not so absolute and sacred as they appear, it is

advisable to consider them so and to make the necessary corrections if for no other reason than to prevent apoplexy among the vital statisticians, should they happen to read the book.

Criticism of details, such as these, is not intended to apply to the book as a whole. The authors are to be commended for producing a text filled from cover to cover with useful information, condensed in form, free from padding, and appropriate for its intended field. M. E. BARNES

Proceedings of the First American Congress on Obstetrics and Gynecology, Cleveland, Ohio, September 11-15, 1939. *Fred L. Adair, Editor. Evanston, Ill.: The Mumm Print Shop, Inc., 1941. 907 pp. Price, \$5.00.*

This is a rather unusual volume in that it portrays the many sides of an important clinical and public health problem. Maternity care has been undergoing many changes in the last 25 years, and some of these changes will, no doubt, remain as permanent improvements. It is timely that a Congress should be held and its proceedings appear during this period of change.

The book is nicely divided into the four sections of Medical, Nursing, Public Health, and Hospital Administrators and Educators. Each of these sections is well covered in the program of the Congress, and the Nursing and Public Health Sections should prove particularly valuable to workers in those fields.

The principal value of the book, no doubt, lies in its exhibition of the "present status" of maternity and infancy problems.

L. A. CALKINS

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Superman, *et al.*—Have you been inclined to be a bit vehement in your opinion of the "funny" books that are spued out, literally by the millions, each month for the edification of the children and infantile-minded adults? Before you go off the deep end it would be well for you to read this discussion of some possible virtues of the current model, stream-lined fairy story.

BENDER, L., and LOURIE, R. S. The Effect of Comic Books on the Ideology of Children. *Am. J. Orthopsychiatry*. 11, 3:540 (July), 1941.

***Diphyllbothrium latum* and Friends**—If you like to eat fresh water fish, perhaps you will be happier if you pass by this discussion of some of the hundred varieties of flukes, tapeworms, and round worms that make life hideous for the finny tribes of the several Great Lakes. As the author says, the well cooked worm is harmless but still the idea is far from appetizing.

DETWILER, J. D. Parasitic Infestations of Fish. *Canad. Pub. Health J.* 32, 6:293 (June), 1941.

Keeping the Tuberculous Out of the Army—Before the service was taken over by the army, the New York City Health Department x-rayed 16,000 odd selectees and guardsmen, at a cost of \$1.47 each. Although the total cost was high it is estimated that this service saved the United States more than 5 millions, for the United States Government eventually pays out \$10,000 for each soldier accepted with tuberculosis. For the statistical findings, see this useful paper.

EDWARDS, H. R., and EHRLICH, D. Examinations for Tuberculosis. *J.A.M.A.* 117, 1:40 (July 5), 1941.

For the Cure of Gonorrhea—Sulfathiazole is best. Other supportive treatments and tests of cure are described.

ELLIOT, H. M., *et al.* Treatment of Gonorrhea in the Male with the Sulfonamides. *Ven. Dis. Inform.* 22, 6:197 (June), 1941 (also)

UHLE, C. A. W., *et al.* Gonorrheal Urethritis in the Male. *J.A.M.A.* 117, 4:247 (July 26), 1941.

Encephalitis Rears Its Ugly Head—St. Louis and western type equine encephalitis combined to make human life miserable in Yakima, Wash. Some patients had one, some the other, and some mixed infections. The sulfonamide drugs didn't help, neither did immune serum in the equine encephalitis cases.

HAMMON, W. McD. Encephalitis in Yakima Valley. *J.A.M.A.* 117, 3:161 (July 19), 1941.

Vitamin C Content of Fruit Juices—What is your vitamin C costing you? At the prevailing market prices at the time of this study the needed 50 ml. of ascorbic acid cost 2.7 cents in the form of canned orange juice, 3.1 cents as canned grape fruit juice, 3.7 cents as fresh orange juice, 4.6 cents as fresh grape fruit juice, 6.3 cents as canned tomato juice, and 13 cents as canned pineapple juice.

HOLMES, A. D., *et al.* Comparative Costs of Vitamin C in Fresh and Commercially Canned Fruit and Vegetable Juices. *New Eng. J. Med.* 225, 2:68 (June 10), 1941.

Tuberculosis Is Not an Industrial Disease, *per se*—Socio-economic conditions are factors as great as, if not greater than, the widely recognized, occupational hazards in producing tuberculosis morbidity and mortality,

but industry still has a responsibility in eliminating the hazards, and in the rehabilitation of the cured employee.

JACOBS, M. S. Tuberculosis in Industry. *Pub. Health Nurs* 33, 7:414 (July), 1941.

Who Gets Hurt and How—

Public accidents cause a third more deaths than all the infections and parasitic diseases combined. Motor vehicle accidents are by far the most important cause. Disability rates from other accidental causes are high too. Men are hurt much more frequently than women, older people more than youngsters, relievers more often than those higher up on the income scale (except in automobiles). Health officials will find a wealth of statistical detail in this analysis.

KLEBBA, J., and BRITTEN, R. H. Public Accidents among the Urban Population as Recorded in the National Health Survey. *Pub. Health Rep.* 56, 28:1419 (July 11), 1941.

Ocular Manifestations of Avitaminosis—In the summary of this excellent but highly technical paper, it states that the biomicroscopic examination is a satisfactory method of detecting early vitamin A deficiencies. Ocular conditions which the examination reveals improve after months of treatment with vitamin A of high potency. [P. S. The summary and discussion were about all I succeeded in mastering.]

KRUSE, H. D. Medical Evaluation of Nutritional Status. *Pub. Health Rep.* 56, 26:1301 (June 27), 1941.

More Trichinosis Findings—Ten per cent of the examinations of the diaphragms from persons dying in Nashville revealed larvae of *Trichinella spiralis*. None were in persons under 20, most were in persons in the fifth decade of life.

MELENEY, H. E. Trichinosis in Human Diaphragms in Nashville, Tennessee. *Am. J. Hyg.* 24, 1:18 (July), 1941.

Hero—Any researcher who infects himself with hookworm in order to count the egg output for a hundred days deserves some kind of a medal. Altogether, approximately seven million appeared. The biggest day's output was 233,000.

PALMER, E. D. The Course of the Daily Egg Output During an Early Infection with the Hookworm *Necator americanus*. *Am. J. Hyg.* 34, 1:1 (July), 1941.

Fifty Times More Costly than Strikes—Fifty million man-days were lost because of illness and accidents among industrial workers last year. Suppose we could prevent 10 per cent! It would be enough to build five battle-ships. Some of the public health implications are strikingly presented. This is the fourth of a series of papers on preparedness, all of which are "musts."

PARRAN, T. The Function of Public Health in Defense (Symposium on Medical Preparedness). *J.A.M.A.* 117, 3:186 (July 19), 1941.

Pertussis Vaccination—More evidence of the value of whooping cough prophylaxis. It is suggested that re-vaccination 2 years after the original immunization is a desirable procedure. The opsonocytaphagic test proves a reliable index of immunity.

RAMBAR, A. C., et al. Studies in Immunity to Pertussis. *J.A.M.A.* 117, 2:79 (July 12), 1941.

For Mask Wearers—Laundering gauze masks enormously increases the bacterial filtering efficiency. Maximum efficiency is reached after twenty launderings. Materials vary widely in filtering efficiency and air resistance, so you had better read the whole article.

ROOKS, R., et al. Hospital Masks: Their Bacterial Filtering Efficiency and Resistance to Air Flow. *Pub. Health Rep.* 56, 28:1411 (July 11), 1941.

Symposium on Polio—Last words on the etiology diagnosis, pathology,

prevention, and care of poliomyelitis by a collection of top-notchers.

SABIN, A. B., *et al.* Etiology of Poliomyelitis (and five related papers). J.A.M.A. 117, 4:267 (July 26), 1941.

Antidote for those Sanitary Blues
—Are you a bit down in the mouth about your job and its real value to this distraught country of ours? Then read this presidential address to the Western Branch A.P.H.A. There's much to be done that's worth while.

SHEPARD, W. P. A National Emergency Exists. Pub. Health Rep. 56, 27:1351 (July 4), 1941.

Suggested by Our British Brethren—Streptococci accumulate in the dust on bedclothes. When the bed is made the dust is spread about in the air. Treating blankets with a spirit

solution of liquid paraffin prevents most of this dust, and is recommended as a routine, just as floors are oiled for the same purpose.

THOMAS, J. C., and VANDEN ENDE, M. The Reduction of Dust-borne Bacteria in the Air of Hospital Wards by Liquid Paraffin Treatment of Bed Clothes. Brit. M. J. 4199:953 (June 28), 1941.

Lead, Arsenic, and Apples—Nine healthy orchardists ate, on the average, three recently sprayed apples a day for a 10 day period. They ingested from 1 to 26 mg. of lead and 0.3 to 6.8 mg. of arsenic per day. Most of it could be accounted for in the excretions but not all. However, no ill effects could be discovered.

WEBSTER, S. H. Lead and Arsenic Ingestion and Excretion in Man. Pub. Health Rep. 56, 27:1359 (July 4), 1941.

BOOKS RECEIVED

SCHOOL HEALTH SERVICES. By W. Frank Walker and Carolina R. Randolph: New York: Commonwealth Fund, 1941. 172 pp. Plus Tables 25 pp. Price, \$1.50.

BRITISH CITIES AT WAR. A Report of the American Municipal Association. By James L. Sundquist. Chicago: Public Administration Service, 1941. 110 pp. Price, \$1.00.

AN IMPROVED AIR SAMPLING DEVICE FOR FIELD WORK. By F. A. Van Atta and Clyde H. McClure. Chicago: Illinois State Department of Labor, 1941. 9 pp.

UNIVERSITY OF PENNSYLVANIA BICENTENNIAL CONFERENCE.

DEVELOPMENT OF OCCLUSION. By William K. Gregory, B. Holly Broadbent and Milo Hellman. Price, \$1.50.

THE STUDY OF MAN. By Lawrence J. Henderson. Price, \$.25.

Philadelphia: University of Pennsylvania Press, 1941.

INFANTILE PARALYSIS. A Symposium Delivered at Vanderbilt University April, 1941. New York: National Foundation for Infantile Paralysis, 1941. 239 pp. Price, \$1.25.

DOCTORS DON'T BELIEVE IT. WHY SHOULD YOU? By August A. Thomen. New York: Simon & Schuster, 1941. 384 pp. Price, \$2.50.

PAPERS OF WADE HAMPTON FROST. A Contribution to Epidemiological Methods. Edited by Kenneth F. Maxcy. New York: Commonwealth Fund, 1941. 628 pp. Price, \$3.00.

ANALYTICAL CHEMISTRY OF INDUSTRIAL POISONS, HAZARDS AND SOLVENTS. By M. B. Jacobs. New York: Interscience Publishers, 1941. 661 pp. Price, \$7.00.

THE WONDER OF LIFE. How We Are Born and How We Grow Up. Milton I. Levine and Jean H. Seligmann. New York: Simon & Schuster, 1940. 114 pp. Price, \$1.75.

EFFECTIVE LIVING. By C. E. Turner and Elizabeth McHose. St. Louis: Mosby, 1941. 432 pp. Price, \$1.90.

THE CHILD AND YOU. By F. J. Kieffer. Milwaukee: Bruce, 1941. 150 pp. Price, \$2.00.

AMERICANS, LIVE LONGER! By W. W. Bauer. Indianapolis: Bobbs-Merrill, 1940. 219 pp. Price, \$2.00.

GERMS AND THE MAN. By Justina Hill. New York: Putnam, 1940. 461 pp. Price, \$3.75.

FORWARD TO HEALTH. The Story of Ten Years in Westchester's Program for a Healthier Community. White Plains: Health Department, 1941. 71 pp. Free.

THE COMPLETE WEIGHT REDUCER. By C. J. Gerling. New York: Harvest House, 1941. 246 pp. Price, \$3.00.

The 70th Annual Meeting

L. Van D. Chandler, Chairman, Publicity Committee

THE Chairman of the Publicity Committee is plagued by the last sentence in the editorial entitled "Attend the Atlantic City Annual Meeting" in this issue. He looks at his friends, all veteran annual meeting attenders, and wonders if one of them is the lucky fellow. He wonders about himself, but knows he does not qualify, because he never borrowed the money to go anywhere, nor could he if he wanted to, and even if he did, how would the editor know? Altogether it is a wholly unsatisfactory last sentence. Where did he borrow the money? Did he learn at the annual meeting how to pay it back? Did he ever pay it back? Which meeting was it, in what city? Was there a race track nearby?

With visions of sugar plums dancing in his head, the Publicity Chairman cautiously approaches his task of telling what will be going on during the 70th Annual Meeting in Atlantic City, the week of October 12. He has many promises and pledges to report, but no member of the New Jersey Committee, including the Executive Secretary, Dr. Salasin, has mentioned living happily ever after. That's something even the Chamber of Commerce and the Convention Bureau have overlooked. No one has said anything, either, about lending money to anybody to finance the trip. If that last point is perfectly clear, he can relax and talk about things that really will happen.

There will be an Annual Meeting, advanced far beyond any former meeting from the point of view of attendance, and extensiveness and quality of the scientific program. No one who

saw the preliminary program in the August JOURNAL can doubt the latter statement, and proof of a record attendance lies in the reservation books of Atlantic City's hotels. There are so many hotels, excellent accommodations at moderate prices are still to be had, but it would be unwise to postpone reserving rooms longer, if convenience to the Convention Hall is desired. The scientific sessions, with very few exceptions, will be held in Convention Hall. Here, too, we register, seek our information, inspect scientific and commercial exhibits, and from here we leave for our tours of inspection and entertainment functions.

Several important program additions have been made since the August JOURNAL went to press. Dr. Huntington Williams, now in England, will contribute his up-to-the-minute observations to the session in which Dr. Parran and Dr. Eliot are already scheduled. Dr. George Baehr, Medical Director of the Office of Civilian Defense, has agreed to speak on the work of the Medical Division.

The National Organization for Public Health Nursing announces the subject of its luncheon session on Friday as "How the Citizen Can Help to Further Public Health Programs." Miss Grace Ross will preside, and the speakers are Dr. Carl Buck, the Association's Field Director, and Dean Walter J. Matherly, President of the Florida State-Wide Public Health Committee.

The International Society of Medical Health Officers has changed the time of its sessions from Monday morning, afternoon, and dinner, to Sunday

afternoon, dinner on Sunday, and Monday morning.

New names representing new fields of interest have been entered on the Health Education Institute teaching roster.

A Health Education Center, conducted for the Health Education Section by the Social Work Publicity Council and the Department of Social Work Interpretation of the Russell Sage Foundation, is a development not previously announced. It is under the supervision of Mrs. Mary Swain Routzahn and Mrs. Sallie Fraysur. Designed originally as an adjunct to the Health Education Institute, its usefulness to all delegates interested in health education was at once obvious, and it was decided to maintain it during the entire convention. All types of health education materials will be assembled here for examination. Consultations will be arranged for the discussion of special problems. The objective is to make the Health Education Center of the utmost practical value.

And there are big things in the wind, not yet ready to be remarked on in detail, but to be mentioned as "in preparation." Invitations have been dispatched in an effort to bring to Atlantic City British public health workers whose experiences in emergency situations will answer questions American health workers are asking now. There is likelihood that the Program Committee's requests will be granted. Further, the Atlantic City Annual Meeting may well turn into a Pan-American Health Congress in a very real sense if the officers of the federal health departments in the twenty Central and South American republics respond to the call sent out to them with the approval of the State Department. If they come, there is opportunity here for an exchange of information beneficial to public health workers in the

United States, to our Latin American colleagues, and to public health in the western hemisphere.

The New Jersey Committee is winding up affairs incident to the reception and entertainment of 4,000 delegates. Tentatively they announce inspection trips to the county institutions, including the new Atlantic County Hospital for Tuberculous Diseases, to the water shed, sewage department and filtration plant, and to the Betty Bacharach Home for Afflicted Children. There are rumors of sail boat rides, bingo parties, golf tournaments, sight-seeing trips, visits to wineries for everybody; and of fashion shows, rolling chair rides, bridge-luncheons, and musical teas for the ladies. They have been planned to fill idle moments before, between, and after the scientific sessions.

The spaciousness of the convention facilities in Atlantic City make it possible to present a scientific exhibit this year of impressive proportions. Federal, state, and local official and voluntary agencies have responded generously to the call, and many of them are creating new exhibits which will be shown here for the first time.

The motion picture program lists a number of films either specially prepared for the 70th Annual Meeting or held so that public health workers might have the privilege of viewing them before they are generally released.

All the machinery of the 70th Annual Meeting moves into operation on Sunday morning, October 12. Registration headquarters will be opened, the Health Education Institute and meetings of related organizations get under way. From that time until Friday afternoon, October 17, the Program Committee, the New Jersey Committee, the managements of hotels and Convention Hall, and the natural beauties of Atlantic City unite to fill every hour satisfyingly.

APPLICATION FOR HOTEL ACCOMMODATIONS

American Public Health Association

Boardwalk Hotels*

Avenue Hotels

Key No.	Single Rooms with Bath	Double Rooms with Bath
32 Ambassador ..	\$3-\$4-\$5-\$6	\$6-\$7-\$8-\$10
22 Brighton	\$3-\$4-\$5	\$5-\$6-\$7-\$8
6-7 Chalfonte-Haddon Hall	\$3-\$4-\$5-\$6-\$8	\$6-\$8-\$10-\$12
33 Chelsea	\$3-\$4-\$5	\$5-\$6-\$7-\$8
28 Dennis	\$3.50-\$4-\$5-\$6	\$6-\$7-\$8-\$9-\$10
14 Knickerbocker	\$3-\$3.50-\$4	\$5-\$6-\$7
11 New Belmont	\$2.50-\$3	\$4-\$5-\$6-\$7
34 President ...	\$3	\$5.50-\$7-\$8
31 Ritz - Carlton	\$3-\$3.50-\$4-\$5	\$5-\$6-\$7-\$8-\$10
4 Seaside	\$3-\$3.50-\$4	\$5-\$6-\$7
29 Shelburne ...	\$4-\$5-\$6-\$8-\$10	\$6-\$7-\$8-\$10-\$12
21 Traymore ...		\$8-\$10-\$12

Key No.	Single Rooms with Bath	Double Rooms with Bath
30 Arlington ...	\$3.50-\$4	\$5-\$6
19 Byron		\$4.50-\$5-\$5.50-\$6
8 Colton Manor	\$3-\$3.50-\$4-\$5	\$5-\$6-\$7-\$8-\$9
25 Crillon*		\$5-\$6
26 Eastbourne ..		\$4.50-\$5-\$6
15 Flanders	\$3-\$4	\$5
24 Glaslyn-Chatham		\$5
17 Jefferson	\$3-\$3.50	\$5-\$6
18 Kentucky ...	\$2.50	\$4
9 Lafayette ...	\$3-\$3.50-\$4	\$5-\$6-\$7
20 Madison	\$3-\$3.50-\$4	\$5-\$6-\$7
16 Monticello ...		\$5
3 Morton	\$2.50-\$3-\$3.50-\$4	\$5-\$6-\$7
10 Penn-Atlantic	\$3	\$5
13 Princess	\$2.50	\$4
Runnymede..	\$2.50-\$3-\$3.50-\$4	\$4-\$5-\$6-\$7
12 Senator	\$3-\$3.50-\$4	\$5-\$6-\$7

All hotels offer Suites and DeLuxe Rooms. Rates can be ascertained by direct correspondence with the individual hotels.

* Breakfast Included

Whenever possible, arrangements should be made for double occupancy of rooms; only a limited number of single rooms are available.

A. J. MORGAN, Chairman

HOTEL COMMITTEE

16 Central Pier,

Atlantic City, N. J.

Dear Sir:—Please make hotel reservations noted below:

Hotel First Choice

Hotel Second Choice

Hotel Third Choice

.... Double Rooms with bath for persons. Rate desired \$.... to \$.... per day

.... Single Rooms with bath. Rate desired \$.... to \$.... per day

.... Suites—Parlor, Bedroom(s) with bath for persons. Rate desired \$.... to \$.... per day

Arriving October, hour A.M. P.M. Leaving

If the hotel of first choice is unable to accept the reservation, the HOTEL COMMITTEE will endeavor to comply with your second or third choice in the order named. You will receive direct confirmation from the hotel accepting the reservation when made.

Rooms will be occupied by:

Name	Street Address	City	State

ASSOCIATION NEWS

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

- Alfred L. Adam, M.D., Municipal Bldg., Natchez, Miss., Director, Adams County Health Dept.
- Oswald N. Andersen, M.D., School of Health, Stanford University, Calif., Director
- N. Paul E. Anderson, M.D., Lane County Court House, Eugene, Ore., Acting Director, Lane County Health Dept.
- Elizabeth E. Bishop, M.D., M.P.H., Court House, Baker, Ore., Baker County Health Officer
- Alpheus W. Blizzard, Ph.D., South Carolina Public Service Authority, Moncks Corner, S. C., Acting Director, Health and Sanitation Div.
- Leroy E. Burney, M.D., M.P.H., 539 Post Office Bldg., Kansas City, Mo., Sub-regional Consultant, U. S. Public Health Service
- Charles C. Crosby, M.D., Jefferson, Ohio, Health Commissioner, Ashtabula County General Health District
- J. Campbell Kern, M.D., North Central District Health Unit, Lewiston, Ida., Director
- John R. McGibony, M.D., Office of Indian Affairs, Washington, D. C., Director of Health
- Thomas F. McGough, M.D., Pulaski, Va., Health Officer
- William Drummond Radcliffe, Jr., M.D., M.P.H., District Health Officer, Belen, N. M.
- Elvin L. Sederlin, M.D., 6 Roberts St., Fargo, N. D., City Health Officer
- Charles I. Silk, M.D., 236 High St., Perth Amboy, N. J., Supervisor, Middlesex County Chest Clinic
- Joseph R. Smith, M.B., City Hall, Galt, Ontario, Can., Medical Officer of Health
- John W. Turner, M.D., 419 N. Third St., Marion, Kans., Marion County Health Officer
- Hugh L. C. Wilkerson, M.D., M.P.H., State Board of Health, Indianapolis, Ind., Surgeon, U. S. Public Health Service

Laboratory Section

- Fred V. Doult, B.C.E., Box 487, Canton, N. C., Chief Chemist, The Champion Paper & Fibre Co.
- Morris Dworski, B.S., C.P.H., 104½ Park Ave., Saranac Lake, N. Y., Bacteriologist, Laboratory of Trudeau Foundation

- Bernice E. Eddy, Ph.D., National Institute of Health, Bethesda, Md., Associate Bacteriologist
- Geoffrey Edsall, M.D., 36 Follen St., Cambridge, Mass., Asst. Director, Biologic Laboratories Div., State Dept. of Public Health
- Harold J. Fournelle, B.A., Minneapolis Dept. of Health, Div. of Sanitation, Minneapolis, Minn., Asst. Sanitarian
- Abraham S. Gordon, M.D., 1376 Union St., Brooklyn, N. Y., Practising Physician
- Omer E. Hagebusch, M.D., 4500 Olive St., St. Louis, Mo., Director of five hospital laboratories
- Dorothy F. Perry, B.A., 55 Shattuck St., Boston, Mass., Technician-in-training, Harvard School of Public Health
- Allan K. Poole, M.D., 107 Whitney Ave., New Haven, Conn., Health Officer, Town of Orange
- Dale C. Stahle, M.D., State Dept. of Health, Harrisburg, Pa., Director, Div. of Pneumonia Control
- Arthur Sutter, 1517 West Phelps, Springfield, Mo., Breeder of White Mice
- Lyle A. Weed, M.D., Ph.D., Indiana University, Medical Center, Indianapolis, Ind.,

Vital Statistics Section

- George F. Badger, M.D., M.P.H., 615 N. Wolfe St., Baltimore, Md., Associate in Biostatistics, Johns Hopkins School of Hygiene and Public Health
- Jean R. D. Gilley, B.A., 540 Howe St., Vancouver, B. C., Can., Statistical Clerk, Div. of Vital Statistics, Provincial Board of Health
- Roslyn L. MacNish, B.S., M.P.H., 10 Blackall Road, Woodmont, Conn., Statistical Asst., Committee on Hygiene of Housing, American Public Health Assn.
- Margaret E. Rice, B.A., Tennessee Valley Authority, Wilson Dam, Ala., Asst. Statistical Clerk, Health and Safety Dept.
- William H. Veigel, 244 Crestview Road, Columbus, Ohio, Chief, Vital Statistics Division, State Dept. of Health

Engineering Section

- Fred M. Ashley, 42 West Culver St., Phoenix, Ariz., Chief Sanitary and Food Inspector, Phoenix Health Dept.

Roy Bremer, A.B., M.S.P.H., Alger-Schoolcraft Health Dept., Manistique, Mich., Sanitarian

Richard F. Greeley, M.S., Old Bridge St., Buzzards Bay, Mass., Chief Operating Engineer, Camp Edwards Sewage Disposal Plant

Robert R. Harris, M.S., 127 North 44th St., Louisville, Ky., Asst. Sanitary Engineer, State Dept. of Health

Vernon L. Harris, State Dept. of Public Health, Boise, Ida., Junior Sanitarian

Patrick J. Monaghan, 200 Florence Ave., Newark, N. J., Asst. Chief Plumbing Inspector, Newark Dept. of Health

Paul A. Scudder, City Hall, St. Petersburg, Fla., Director of Sanitation, Health Dept.

Andrew M. Trupkovitz, 134 Lawn Ave., Stamford, Conn., Food and Sanitary Inspector, City of Stamford

Food and Nutrition Section

S. Ansbacher, Dr.Sc., 50 East 42nd St., New York, N. Y., Research Director, International Vitamin Corp.

Henry E. Becker, Roseland, N. J., President, Henry Becker & Son, Inc.

Elizabeth Frey, B.S., 309 "C" St., Marysville, Calif., District Nutritionist, State Dept. of Public Health

Roy R. Gockley, B.S., 11 West 42nd St., New York, N. Y., Manager, Sales Dept., Dairy-men's League Co-Operative Assn., Inc.

Bernice Hopper, M.S., State Dept. of Public Health, Nashville, Tenn., Nutritionist

Leonard C. Huggins, M.B., D.P.H., Bahamas General Hospital, Nassau, Bahamas, B.W.I., Acting Asst. Medical Officer

Helen L. Johnson, B.S., Norton Road, Kensington, Conn., Consultant in Nutrition, State Dept. of Health

Elsa Orent-Keiles, Sc.D., Beltsville Research Center, Beltsville, Md., Associate Nutrition Chemist, Foods and Nutrition Div., U. S. Dept. of Agriculture

Maternal and Child Health Section

Edith M. Baker, Children's Bureau, U. S. Dept. of Labor, Washington, D. C., Principal Consultant in Medical Social Work

Bessie Mae Beach, M.D., 901½ S.R.R. St., Opelika, Ala., Consultant Pediatrician, State Dept. of Health

Nancy D. Campbell, M.D., San Miguel County Health Dept., Las Vegas, N. M., Maternal and Child Health Consultant, State Dept. of Public Health

Mary W. Keefer, M.A., 1940 Biltmore Street, N.W., Washington, D. C., Medical Social Consultant, Children's Bureau, U. S. Dept. of Labor

Harmon Tremaine, M.D., 2314 State St.,

Boise, Ida., Chairman, Health & Safety Committee, Boise Area, Boy Scouts of America

Laura P. Wells, M.S., 718 Oregon Bldg., Portland, Ore., Consultant in Nutrition, Maternal and Child Health Div., State Board of Health

Public Health Education Section

Virginia H. Campbell, B.S., Richmond Health Bureau, Richmond, Va., Director of Nurses
Dr. William T. Crouch, P. O. Box 484, Mount Hope, W. Va., Registered Pharmacist, MacDonald Drug Co.

Marjorie Edwards, 277 Pine St., San Francisco, Calif., Executive Secretary, California Heart Assn.

Samuel B. English, M.D., Glen Gardner, N. J., Supt. and Medical Director, New Jersey State Sanatorium

Rosemary M. Kent, M.A., 221 Oak Park, Box 123, Norris, Tenn., Health Education Coordinator, Norris Town-Anderson County Health Education Project

Emma M. McLean, 293 Schermerhorn St., Brooklyn, N. Y., Asst. in Health Education, Brooklyn Tuberculosis and Health Assn.

Edna H. Pearson, R.N., 574 Oakwood St., Pittsburgh, 21, Pa., Supervisor of Health Educators, State Dept. of Health

Edith R. Stuckey, 15 East Kinney St., Newark, N. J., Director, Public Information, N. J. Tuberculosis League

Ruth Wadman, A.B., Hotel Seville, Madison Ave. at 29th St., New York, N. Y., Consultant in Medical Social Work, Div. of Crippled Children, Dept. of Health

Public Health Nursing Section

Alice C. Chapin, 1196 Bedford St., Stamford, Conn., Nurse, City Health Dept.

Pearl P. Coulter, M.A., Peabody College, Nashville, Tenn., Associate Professor of Nursing Education

Ruth Havenor, B.S., State Dept. of Public Health, Boise, Ida., Acting Orthopedic Advisory Nurse

Ethel L. Hoffa, City Health Dept., Kalamazoo, Mich., Venereal Disease Case-Finder for Fort Custer Area

Lillian J. Johnston, 10 Chester Ave., White Plains, N. Y., Supervising Public Health Nurse, Westchester County Dept. of Health
Winona Nordlind, Kootenai County Health Unit, Coeur d'Alene, Ida., Senior Nurse

Grace M. Taylor, R.N., Box 197, Grace, Ida., Staff Nurse, Bannack County Health Unit

Margaret S. Taylor, R.N., M.A., 675 Delaware Ave., Buffalo, N. Y., Educational Director, Buffalo Visiting Nursing Assn.

Evelyn T. Walker, 31 Rector Place, Red Bank, N. J., Director of Health and Welfare, Monmouth County Organization for Social Service

Margaret Willhoit, B.S., C.P.H., 602 Glenwood, Kansas City, Mo., Supervisor of Public Health Nursing, Health Dept.

Epidemiology Section

Oscar N. Allen, Ph.D., Dean Hall 201, Univ. of Hawaii, Honolulu, T. H., Professor of Bacteriology

Louis H. Block, M.D., 185 N. Wabash Ave., Chicago, Ill.

Jose C. Bustos, M.D., M.P.H., Diaz Miron No. 17, Jalapa, Veracruz, Mexico, Director of Public Health

Dr. Jose Amador Guevara, 731 Tappan, Ann Arbor, Mich., Student, Univ. of Michigan
Pascal F. Lucchesi, M.D., Municipal Hospital, 4000 N. Front St., Philadelphia, Pa., Supt. and Medical Director, Philadelphia Hospital for Contagious Diseases

Louis Platt, M.D., M.S.P.H., 34 South St., Middletown, N. Y., Asst. District Health Officer, State Dept. of Health

Caroline R. Shreve, 1225 Arctic Ave., Atlantic City, N. J., Director, Atlantic County Public Health Service

Unaffiliated

Felix A. Hennessy, M.D., Calmar, Iowa, Trainee, University of Minnesota

APPLICANTS FOR FELLOWSHIP

In accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Eligibility, and the Governing Council will take place at the Atlantic City Annual Meeting.

Health Officers Section

Guillermo Arbona, M.D., M.P.H., Health Officer, Public Health Unit, Rio Piedras, P. R.

Earl P. Bowerman, M.D., M.P.H., Gibson County Health Officer, Trenton, Tenn.

Richard F. Boyd, M.D., M.P.H., Director, Division of Local Health Services, State Board of Health, Topeka, Kans.

Irmel W. Brown, M.D., M.P.H., Director, Kalamazoo City-County Health Department, Kalamazoo, Mich.

Edwin Cameron, M.D., M.P.H., Executive Secretary, State Board of Health, Dover, Del.

W. Ross Cameron, M.D., M.P.H., Deputy State Health Officer, State Department of Health, Baltimore, Md.

Francis M. Carroll, M.D., Commissioner of Health, Health and Sanitation Department, Seattle, Wash.

Donald G. Evans, M.D., D.P.H., Director, State Department of Health, Seattle, Wash.

John W. Ferree, M.D., M.P.H., Director and Secretary, State Board of Health, Indianapolis, Ind.

Richard H. Fletcher, M.D., M.P.H., Assistant Director, State Department of Health, Seattle, Wash.

Joseph P. Garen, M.D., M.P.H., District Health Officer, Saranac Lake, N. Y.

Adelard Groulx, M.D., M.P.H., Director, Department of Health, Montreal, Que., Canada

John F. Hackler, M.D., M.P.H., Director, Field Technical Unit, State Health Department, Oklahoma City, Okla.

John B. Hall, Jr., M.D., M.S.P.H., District Health Superintendent, Cook County Public Health Unit, Chicago, Ill.

Robert H. Hutcheson, M.D., M.P.H., Assistant Commissioner, State Health Department, Nashville, Tenn.

Rutherford O. Ingham, M.D., M.P.H., Health Officer, Washington County Department of Health, Jonesboro, Ala.

Arthur M. Johnson, M.D., Health Officer, Rochester, N. Y.

Matthew R. Kinde, M.D., Field Director, W. K. Kellogg Foundation, Battle Creek, Mich.

John J. Lentz, M.D., Director, Davidson County Health Department, Nashville, Tenn.

Lynn J. Lull, M.D., M.P.H., Director, Division of Venereal Disease Control, State Board of Health, Denver, Colo.

Edward G. McGavran, M.D., M.P.H., Director, West Virginia Public Health Training Center and Monongalia County Health Department, Morgantown, W. Va.

Frederick A. Musacchio, M.D., M.S.P.H., Director, Acadia Parish Health Unit, Crowley, La.

Herbert L. Newcombe, M.D., M.P.H., Director, Kootenai County Health Unit, Coeur d'Alene, Ida.

Edward A. Piszczek, M.D., M.P.H., Health Officer, Cook County Public Health Unit, Chicago, Ill.

Hugh B. Robins, M.D., Director, Calhoun County Health Department, Marshall, Mich.

Gradie R. Rowntree, M.D., M.P.H., Assistant Director of Health and Director, Communicable Disease Control, City Health Department, Louisville, Ky.

Daniel L. Seckinger, M.D., Dr.P.H., Assistant Health Officer, Washington, D. C.

Lawrence J. Smith, M.D., Commissioner of Public Health, Springfield, Mass.

Charles A. Steurer, M.D., Director, Division of Communicable Diseases, Nassau County Department of Health, Mineola, L. I., N. Y.

George M. Uhl, M.D., M.S.P.H., Coördinating Officer, State Department of Public Health, Berkeley, Calif.

Harry Wain, M.D., M.S.P.H., Health Commissioner, Sidney and Shelby County, Sidney, Ohio

Herman G. Weiskotten, M.D., Dean, College of Medicine, Syracuse University, Syracuse, N. Y.

John B. West, M.D., M.P.H., Assistant Bureau Director, Board of Health, Chicago, Ill.

Laboratory Section

Irving H. Borts, M.D., Associate Director, State Hygienic Laboratory, Iowa City, Ia.

Charles M. Brewer, Ph.D., Senior Bacteriologist, Insecticide Division, U. S. Department of Agriculture, Washington, D. C.

J. Howard Brown, Ph.D., D.Sc., Associate Professor of Bacteriology, Johns Hopkins University Medical School, Baltimore, Md.

Donald C. A. Butts, D.Sc., Professor of Bacteriology, Pennsylvania State College of Optometry, Philadelphia, Pa.

Charles M. Carpenter, M.D., M.P.H., Associate Professor of Bacteriology, University of Rochester School of Medicine and Dentistry, Rochester, N. Y.

Katherine E. Cox, A.B., Director, West Virginia State Hygienic Laboratory, Charleston, W. Va.

Lt. Col. Wesley C. Cox, M.D., Dr.P.H., Department Medical Inspector, Medical Corps, U. S. Army, Quarry Heights, C.Z.

Jessie E. Dow, Pd.B., Senior Bacteriologist, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Grace Eldering, Sc.D., Bacteriologist, State Department of Health, Lansing, Mich.

Russell Gottshall, Ph.D., Senior Bacteriologist and Assistant Director, Biologic Products Laboratory, State Department of Health, Lansing, Mich.

Ivan C. Hall, Ph.D., Pd.B., Professor and

Head, Department of Bacteriology, University of Colorado Medical School, Denver, Colo.

Walter T. Harrison, M.D., Senior Surgeon, U. S. Public Health Service, San Francisco, Calif.

Luey S. Heathman, M.D., Ph.D., Assistant Director and Chief of Laboratories, Division of Preventable Diseases, State Department of Health, Minneapolis, Minn.

Charles A. Hunter, Ph.D., Director, Public Health Laboratories, State Board of Health, Topeka, Kans.

J. F. Mahoney, M.D., Director, Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island, N. Y.

Catherine R. Mayfield, M.S., Bacteriologist, State Board of Health, Jackson, Miss.

Morris Scherago, D.V.M., Professor of Bacteriology and Head, Department of Bacteriology, University of Kentucky, Lexington, Ky.

Joseph I. Schleifstein, M.D.C.M., Associate Diagnostic Pathologist, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Howard J. Shaughnessy, Ph.D., Chief, Division of Laboratories, State Department of Health, Chicago, Ill.

John T. Tripp, Ph.D., Associate Director of Biologics, State Department of Health, Lansing, Mich.

Henry Welch, Ph.D., Senior Bacteriologist, Food and Drug Administration, Federal Security Agency, Washington, D. C.

Vital Statistics Section

Clyde A. Bridger, M.S., Statistician, State Department of Public Health, Boise, Ida.

Edwin L. Crosby, M.D., Dr.P.H., Assistant Director, Johns Hopkins Hospital, Baltimore, Md.

Ralph C. Fletcher, M.A., Director, Bureau of Social Research, Pittsburgh, Pa.

Marguerite F. Hall, Ph.D., Instructor, Division of Hygiene and Public Health, University of Michigan, Ann Arbor, Mich.

Theodore A. Janssen, M.S., Chief, Nosology Section, Bureau of the Census, Washington, D. C.

Francis E. Kester, Ph.B., Senior Statistician, State Board of Health, Madison, Wis.

Henry J. Klein, B.S., Supervisor, Statistical Bureau, Metropolitan Life Insurance Company, New York, N. Y.

Billy Tober, State Registrar of Vital Statistics and Supervisor of Finance, State Department of Public Health, Santa Fe, N. M.

Robert G. Webster, B.S., Chief Deputy Registrar, Los Angeles County Health Department, Los Angeles, Calif.

Engineering Section

- Frank E. DeMartini, B.S., Passed Assistant Sanitary Engineer, U. S. Public Health Service, Washington, D. C.
- Paul D. Haney, M.S., Associate Engineer, State Board of Health and Assistant Professor of Sanitary Engineering, University of Kansas, Lawrence, Kans.
- Herbert A. Kroeze, B.S. in C.E., Director, Division of Sanitary Engineering, State Board of Health, Jackson, Miss.
- Carl E. Schwob, M.S., Principal Sanitary Engineer, State Department of Public Health, Chicago, Ill.
- William E. Stanley, C.E., Professor of Sanitary Engineering, Cornell University, Ithaca, N. Y.
- Edward Wright, Sanitary Engineer, State Department of Public Health, Boston, Mass.

Industrial Hygiene Section

- John Buxell, M.S., Chief Engineer, Industrial Hygiene Service, Health Division, St. Louis, Mo.
- Herbert C. Clare, M.S., Director, Division of Industrial Hygiene, State Department of Public Health, Boise, Ida.
- Donald E. Cummings, B.S., Professor of Industrial Hygiene, School of Medicine, University of Colorado, Denver, Colo.
- Frederick H. Goldman, Ph.D., Chemist, National Institute of Health, Bethesda, Md.
- Kenneth E. Markuson, M.D., M.P.H., Director, Bureau of Industrial Hygiene, State Department of Health, Lansing, Mich.
- Kenneth M. Morse, M.S., Industrial Hygiene Engineer, State Department of Health, Chicago, Ill.

Food and Nutrition Section

- Fuller D. Baird, B.S., Director, Nutritional Laboratory, National Oil Products Co., Harrison, N. J.
- Martha Koehne, Ph.D., Nutritionist, State Department of Health, Columbus, Ohio
- Helen S. Mitchell, Ph.D., Research Professor in Nutrition, Massachusetts State College, Amherst, Mass.
- Charles R. Moulton, Ph.D., Counsellor on Food and Nutrition, Chicago, Ill.
- Charlotte Raymond, B.A., Community Nutritionist, Newton Health Dept., (Now Nutrition Consultant to Harvard-Red Cross Unit in England), Newtonville, Mass.

Maternal and Child Health Section

- Hugh J. Bickerstaff, M.D., M.P.H., Associate in Public Health Administration, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

- Edythe Hershey, M.D., Director of Maternal and Child Health, State Board of Health, Helena, Mont.
- Albert McCown, M.D., Dr.P.H., Director, Child Health Project, Kips Bay-Yorkville Health District, New York, N. Y.
- Frances C. Rothert, M.D., M.P.H., Regional Medical Consultant, U. S. Children's Bureau, New Orleans, La.
- John M. Saunders, M.D., C.P.H., Regional Medical Consultant, U. S. Children's Bureau, Washington, D. C.
- Nina Simmonds, Sc.D., Lecturer in Medicine, University of California Medical School, and Lecturer in Nutrition, University of California College of Dentistry, San Francisco, Calif.
- George M. Wheatley, M.D., Assistant Medical Director, Welfare Division, Metropolitan Life Insurance Company, New York, N. Y.
- Robert G. White, M.D., M.S.P.H., District Health Officer, State Department of Health, Valley City, N. D.

Public Health Education Section

- Helen M. Baukin, D.H., Supervising Dental Hygienist, Department of Public Instruction, Honolulu, T. H.
- Margaret Bell, M.D., F.A.C.P., Chairman, Department of Physical Education for Women, and Physician, Health Service, University of Michigan, Ann Arbor, Mich.
- Muriel F. Bliss, M.Ed., C.P.H., Director of Education, Nassau County Cancer Committee, Mineola, L. I., N. Y.
- William Arkwright Doppler, Ph.D., Field Director, Adult Health Education Service, National Tuberculosis Association, New York, N. Y.
- Morris Fishbein, M.D., Editor, Journal of the A.M.A. and Hygeia, American Medical Association, Chicago, Ill.
- Ethel M. Hendriksen, Instructor, Public Health Education, State Department of Health, Albany, N. Y.
- Mildred M. Ihrig, M.A., Supervisor, Welfare Division, Metropolitan Life Insurance Company, San Francisco, Calif.
- N. P. Neilson, Ph.D., Executive Secretary, American Association for Health, Physical Education and Recreation, Washington, D. C.
- Minnie K. Oed, M.S.P.H., Health Educator, Department of Health, Detroit, Mich.
- Ellen C. Potter, M.D., F.A.C.P., Director of Medicine, N. J. Department of Institutions and Agencies, Trenton, N. J.
- David Resnick, Director of Publicity, National Society for the Prevention of Blindness and

Henry Street Visiting Nurse Service, New York, N. Y.

David A. Van der Slice, M.D., M.S.P.H., Instructor, Division of Hygiene and Public Health, University of Michigan, and Director, School of Health Service, Board of Education, Ann Arbor, Mich.

Amelia T. Wood, M.D., Director of Health Service and Instructor in Hygiene, Ball State Teachers College, Muncie, Ind.

Mary M. Wyman, A.M., Supervisor of Health and Safety Education, Board of Education, Louisville, Ky.

Public Health Nursing Section

Gladys L. Crain, Director, Visiting Nurse Association, Buffalo, N. Y.

Rena Haig, M.A., Chief, Public Health Nursing Service, State Department of Public Health, San Francisco, Calif.

Epidemiology Section

A. M. Clarkson, M.D., C.P.H., Director, Division of Venereal Diseases, State Department of Health, Austin, Tex.

Burke Diefendorf, M.D., District State Health Officer, State Department of Health, Glens Falls, N. Y.

Robert Dyar, M.D., Dr.P.H., Director, Special Syphilis Study, San Joaquin Local Health District, Stockton, Calif.

Walter C. Earle, M.D., Director, Champaign-Urbana Public Health District, Champaign, Ill.

John E. Elmendorf, Jr., M.D., Staff Member, International Health Division, Rockefeller Foundation, New York, N. Y.

Lloyd J. Florio, M.D., Dr.P.H., Associate Professor of Public Health and Laboratory Diagnosis, University of Colorado, Denver, Colo.

Thomas Francis, Jr., M.D., Professor of Epidemiology, University of Michigan School of Public Health, Ann Arbor, Mich.

Arthur H. Graham, M.D., C.P.H., Director, East Alabama Health District, Opelika, Ala.

William Grossmann, M.D., C.P.H., Director, Bureau of Communicable Diseases, State Department of Health, Richmond, Va.

Ralph H. Heeren, M.D., M.P.H., Assistant Professor of Hygiene and Preventive Medicine and Chief, Division of Communicable Diseases of University Health Department, University of Iowa, Iowa City, Ia.

John H. Korns, M.D., Director, Division of Tuberculosis, Westchester County Health Department, White Plains, N. Y.

Alexander D. Langmuir, M.D., M.P.H., Deputy Commissioner, Westchester County Health Department, White Plains, N. Y.

Alberto P. Leon, M.D., M.P.H., Professor of Preventive Medicine and Hygiene, Medical School, National University, Mexico City, Mex.

Daniel F. Milam, M.D., M.P.H., Field Staff Member, Rockefeller Foundation, Chapel Hill, N. C.

William Mosley, M.D., D.P.H., Director of Field Training, School of Hygiene, University of Toronto, Toronto, Ont., Canada

Hernan Romero, M.D., M.S.P.H., Professor of Preventive Medicine and Hygiene, University of Chile, and Fellow, Rockefeller Foundation, Santiago, Chile, S. A.

Fred L. Soper, M.D., Dr.P.H., Member Field Staff, International Health Division, Rockefeller Foundation, Rio de Janeiro, Brazil, S. A.

Cecil B. Tucker, M.D., M.P.H., Director, Division of Preventable Diseases, State Department of Public Health, Nashville, Tenn.

Samuel L. Wadley, M.D., M.P.H., Director, Bureau of Communicable Diseases and Epidemiologist, Health Department, Memphis, Tenn.

Ruth H. Weaver, M.D., M.P.H., Registrar of Vital Statistics, Department of Health, Philadelphia, Pa.

Willard H. Wright, D.V.M., Ph.D., Professor of Zoölogy and Chief, Division of Zoölogy, National Institute of Health, Washington, D. C.

Harlin L. Wynns, M.D., M.P.H., Chief, Bureau of Epidemiology, State Department of Public Health, Berkeley, Calif.

Unaffiliated

Benjamin R. Allison, M.D., Chairman, Nassau County Board of Health, Hewlett, L. I., N. Y.

Dudley P. Glick, Ph.D., Associate Professor of Bacteriology, Colorado State College, Ft. Collins, Colo.

Jean Gregoire, M.D., Dr.P.H., Deputy Minister of Health, Ministry of Health, Quebec, Que., Canada

Milton I. Levine, M.D., Research Pediatrician, Research Division, Department of Health, New York, N. Y.

Guy G. Lunsford, M.D., Director, Division of Local Health Organizations, State Department of Health, Atlanta, Ga.

Samuel B. McPheeters, M.D., Director of Public Health, Wayne County Health Department, Goldsboro, N. C.

William F. Wells, B.S., Associate Professor of Air-borne Infection and Director of Laboratories for the Study of Air-borne Infection, School of Medicine, University of Pennsylvania, Philadelphia, Pa.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearing house on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

UNASSEMBLED EXAMINATIONS IN WEST VIRGINIA

The Merit System Council of West Virginia, Box 873, Morgantown, has announced that it is expected that unassembled examinations will shortly be given for the following positions in the West Virginia State Health Department.

<i>Position</i>	<i>Salary per month</i>
Chief of Medical Services	\$325-400
Ophthalmologist	275-350
Director of County Health Work	350-400
Director, Maternal and Child Hygiene.....	350-400
Director, Communicable Diseases	350-400
Director, Vital Statistics	350-400
Director, Industrial Hygiene	350-400
Assistant Director, Maternal and Child Hygiene	320-375
Assistant Director, Communicable Diseases (Venereal).....	320-375
Assistant Director, Tuberculosis	320-375
Venereal Disease Consultant	320-375
Senior Health Officer	320-375
Junior Health Officer	280-320
Health Officer Trainee	200

Residence in West Virginia has been waived in consideration of the applications for these positions. However, residents of the state may be given preference in making appointments. Complete information may be obtained by writing to the Merit System Council.

U. S. CIVIL SERVICE COMMISSION

The Commission has announced that applications will be received for positions as Senior Medical Officer (\$4,600), Medical Officer (\$3,800) and Associate Medical Officer (\$3,200) for appointments in the Public Health Service, with the Food and Drug Administration, Veteran's Administration, and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington.

Junior Public Health Nurse. A civil service examination for Public Health Nurse (\$2,000) has been open for some

time. Nurses who have been unable to qualify for this examination because of the experience requirement now have an opportunity to qualify through a new Junior Public Health Nurse examination (\$1,800) which requires no experience. Applications are also being received for examinations now open for Junior Graduate Nurse (\$1,620) and Graduate Nurse for general staff duty (\$1,800). Further information and application forms may be obtained at any first or second class post office or from the Civil Service Commission, Washington.

POSITIONS AVAILABLE

Young woman, trained in Home Economics, for group contact work in behalf of an important commercial organization whose products are useful in the protection of public health and the National Nutrition Program. Experience in the public health field or related fields is essential. Office in New York, some travel involved. Write Box H, Employment Service, A.P.H.A.

Public Health Engineer with the Department of Health of a city of 100,000 population in the Midwest. Give age, training, experience and references. Write Box M, Employment Service, A.P.H.A.

Southern State Department of Health

seeks physicians qualified by training and experience as County Health Officers or as Pediatricians. Write Box B, Employment Service, A.P.H.A.

Western State Department of Health will consider applications from physicians with experience and a degree in public health. Write Box S, Employment Service, A.P.H.A.

Sanitary Chemist for sewage laboratory in eastern city. Salary \$2,000. Graduate preferred. Write Box V, Employment Service, A.P.H.A.

Physician with public health training to serve as full-time county health officer in rural South Atlantic area. Salary

\$3,600 to \$4,000. Write Box C, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have 4 months' postgraduate instruction under one of the rec-

ognized public health nursing courses and 1 year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, New Mexico.

POSITIONS WANTED

The Employment Service is in touch with specialists in several branches who wish teaching positions.

ADMINISTRATIVE

Physician with M.P.H. from Johns Hopkins, experienced as county and district health officer, seeks responsible administrative position. A-458

Physician with Dr.P.H. from Johns Hopkins, special interests in mental hygiene and epidemiology, well experienced in teaching, will consider administrative, teaching or investigating work. A-486

Physician with M.P.H. from Johns Hopkins 1924, experienced as state director for communicable diseases, as county health officer and as director of field training center, will consider responsible position with good income. A-483

Physician, graduate of the University of Iowa, candidate for Dr.P.H. at Harvard, seeks good administrative position. A-476

Physician, aged 44, graduate of Rush Medical, M.P.H. from Johns Hopkins 1941, and experienced as director of rural health unit, will consider opening. A-480

Physician, aged 39, excellent graduate training and experience in public health, specialized in tuberculosis and epidemiology, now employed, will consider position with salary of \$4,500 or better. A-473

Experienced physician, graduate University of Illinois, M.P.H. Johns Hopkins 1940, seeks administrative opening suitable to his proven ability. Excellent references. A-466

Dentist, University of Pittsburgh, D.D.S., M.P.H. University of Pennsylvania 1941, experienced in practice, wishes an administrative position in public health, preferably at state level. M-450

HEALTH EDUCATION

Woman with M.S. in public health, University of Michigan; and Ph.D. in health education, New York University; experienced in public schools, teachers colleges, and community public health, now employed as health teaching supervisor, will consider position in school, organization or industry. H-236

Young woman with Master's degree in Health Education, Teacher's College, Columbia University, and background of clinical laboratory work and biochemistry, seeks position as health educator in research or as laboratory assistant in public health. H-494

Health Educator, man 32, M.S.P.H., with excellent training and varied experience in education and public health. Would expect salary of \$3,000. Prefers national or state organization. Excellent references. H-405

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. H-497

Young woman, M.S.P.H. University of Michigan, specialized in adult and community health education, seeks position. Experienced in administrative work in commercial field and in teaching. Available now. H-496

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public Health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

LABORATORY

Experienced Bacteriologist. Man, 56 with long record as successful university teacher, research worker and head of department of bacteriology and public health, desires new location in educational, research or public health organization. Available at once. L-462

Laboratory Director, unusually well qualified and experienced man, aged 41, Ph.D. with training at Michigan, M.I.T., and Maryland. Excellent references. Will consider administrative, teaching or research position in public health. L-459

Experienced woman bacteriologist, now employed, graduate Iowa State College 1925, 6 months on Fellowship at Johns Hopkins 1930, wishes position in serology, bacteriology or research. L-458

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology, and serology, will consider opening. L-427

Experienced laboratory technician. Woman with 17 years in large midwest municipal laboratory. Has 12 years' background in the Kahn test. Excellent ref-

erences. Immediately available. Will consider any location. L-460

SANITARY ENGINEERING

Engineer, aged 38, 3 years' experience as district sanitary supervisor, state department of health, together with work on plumbing, heating, and ventilation. Will consider position in the plumbing or heating field or state department of health. Prefers middle western or western states. E-453

Public Health Engineer, M.S. Harvard, experienced in public health and industrial hygiene, wishes position of better sort in

public health engineering or industrial hygiene. E-470

Public Health Engineer, M.S. Harvard, with more than 10 years' experience including 5 years with state division of sanitation, is available. E-468

STATISTICAL

Public Health Statistician. Young man, M.S.P.H. Michigan, now employed as supervisor of state health project, experienced in medical economic research, epidemiology studies and vital statistics, seeks position in city or state health department in midwest. S-458

Advertisement

Opportunities Available

PUBLIC HEALTH PHYSICIANS—(a) Physicians who has specialized in obstetrics and pediatrics, with semester's training in public health, for interesting appointment; state health department. (b) Young physician (under 35) trained or interested in public health work for county health appointment; man over 35 eligible if thoroughly experienced. (c) Venereal disease control officer; city of 70,000; should be able to take charge of new duties by October 1. (d) Physician interested in research in leprosy, but willing to do some general practice; opening in country enjoying unusually mild climate. (e) District health physicians for 9 month replacement appointments; yearly rate \$4,250-\$4,500, plus travel allowance; possibility permanency. PH9-1, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago. (f) Director, health service, public school system; midwestern city of 100,000.

PUBLIC HEALTH NURSE—(a) For division of venereal disease control, city of nearly 150,000; duties consist of interviewing patients and making home visits for case finding and case holding, plus rotating attendance at evening clinic with two other nurses; \$1,500, plus auto allowance. (b) Junior and senior public health nurses for appointments in state health department; \$135-\$160; generalized

program. (c) Teaching supervisor for outpatient department, fully approved hospital; degree, experience required; California. (d) College nurse; duties include routine care of infirmity patients, assisting in dispensary and health clinic; 10 bed infirmity; should be interested in educational aspects which every health difficulty affords; excellent opportunity for one wishing to specialize in health service; New England. PH9-3, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

BACTERIOLOGIST—For instructorship in university; work involves taking charge of laboratory work in general bacteriology for class of 80 students; public health course will include water and milk analyses, disinfectant testing, and some work with foods other than milk; about \$2,500. PH9-4, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—For vacancies in men's and women's divisions of university health service; teaching experience required; large department, offering opportunities for advancement in student health work. PH9-2, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

Situations Wanted

Certified public health physician; Bachelor's and medical degrees from southern university; C.P.H., Johns Hopkins; 4 years, director student health service, state university; 5 years, executive position with state health department. PH9-5, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

Public health nurse executive; B.S. in Nursing Education; M.S. in Health Education; certificate in Public Health Nursing; record of successful executive experience in public health field. PH9-6, Med-

ical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

Public health nurse; fairly recent graduate of midwestern training school; certified public health nurse. PH9-7, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

Bacteriologist; A.B., Ph.D., state university; 6 years, university laboratory of animal pathology; 4 years, parasitologist, state department public health. PH9-8, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

THE NEW YORK MEDICAL EXCHANGE

A—Public health physician, venereal disease control, South, \$3,200-\$3,600.

B—Medical officer, charge of 25 bed hospital, trained in surgery, Newfound-

land, \$2,400 full maintenance, private practice permitted. New York Medical Exchange (Patricia Edgerly, Director) 489 Fifth Avenue, New York, N. Y.

NEWS FROM THE FIELD

HAITI CONFERENCE ON GULF AND CARIBBEAN HEALTH

DR. MIGUEL E. BUSTAMANTE, Director of the Laboratory of Epidemiology and Biostatistics, Institute of Health and Tropical Diseases, Mexico, D.F. has written of the Conference of Caribbean and Gulf Nations recently held in Port-au-Prince, Haiti. The conclusions of the Public Health Section are in agreement, according to Dr. Bustamante, with the editorial on the Caribbean Area and Tropical Health in the May *American Journal of Public Health* (page 505).

These recommendations propose the formation of public health societies in the Caribbean and Gulf countries, with the aim of eventually having an international affiliation.

It was proposed that the *International List of Causes of Death* should be uniformly used for mortality records and that similar uniform methods should be used for the reporting of communicable diseases.

It was further proposed that the Puerto Rico School of Tropical Medicine, the Institute of Health and Tropical Diseases of Mexico, the Finlay Institute of Cuba, and the Gorgas Laboratories of Panama should be developed as centers for advanced study by the health workers of the Gulf and Caribbean countries. Fellowships for this purpose ought to be established, in the opinion of the meeting.

The Public Health Section recommended that such institutions as the School of Malariology at Caracas, Venezuela, should be used for training personnel from other countries.

The section further declared that yellow fever has been eradicated from the Caribbean area and that it was highly necessary to maintain with great care the present status with regard to this and other similar diseases.

U. S. INDIAN SERVICE TUBERCULOSIS STUDY

DR. HORACE DELIEN, Special Physician in Tuberculosis Control of the Indian Service for California, Nevada, and Utah, with headquarters in San Francisco, Calif., has been assigned to the duties of Special Expert in Tuberculosis, a position formerly held by Dr. Joseph A. Aronson, who has been called to duty in the U. S. Army. Under the new assignment, Dr. DeLien will continue the studies in vaccination with BCG which were initiated by Dr. Aronson. Vaccinated groups and controls among Indian children are being observed in North Dakota, South Dakota, Wyoming, Arizona, and Alaska. Dr. DeLien will continue to supervise the general tuberculosis control program of the Indian Service in the states under his former assignment.

NEW LABORATORY TO STUDY VIRUS DISEASES

A LABORATORY will be established at the University of Michigan, Ann Arbor, under a grant of \$30,000 from the National Foundation for Infantile Paralysis. The laboratory will temporarily be operated in the University Hospital but on completion of the new School of Hygiene and Public Health will be transferred there. Infantile paralysis and other virus diseases

will be studied in the new laboratory, and field studies in nearby communities will be made to promote the work.

IOWA PUBLIC HEALTH ASSOCIATION

AT its recent Annual Meeting the Iowa Public Health Association elected the following officers to serve for the coming year:

President—Harry H. Ennis, M.D., Decorah
President-elect—R. M. Sorensen, M.D., Des Moines

Vice-President—Grace Haven, R.N., Waterloo
Secretary-Treasurer—Carl F. Jordan, M.D., Des Moines

SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION

AT its recent Annual Meeting, the South Carolina Public Health Association elected the following officers to serve for the ensuing year:

President—A. W. Humphries, M.D., Camden
President-elect—J. E. Brodie, M.D., Greenwood

1st Vice-President—G. A. Bunch, D.D.S., Columbia

2nd Vice-President—S. B. Pringle, Beaufort
Secretary-Treasurer—Mrs. Frank George, R.N., Columbia

THE MAY BILL BECOMES LAW, JULY 11, 1941

THE U. S. Congress has enacted and the President has signed Public Law 163, 77th Congress, Chapter 287, 1st Session (H.R. 2475) commonly known as the May Bill, an act to prohibit prostitution within such reasonable distance of military or naval establishments as the Secretaries of War and Navy shall determine to be needful to the efficiency, health, and welfare of the Army and Navy.

Until May 15, 1945, the Bill provides that prostitution shall be unlawful under federal authority. The Secretaries of War and of the Navy and the Federal Security Administrator are authorized and directed to take such steps as they deem necessary to suppress and

prevent prostitution and to accept the coöperation of the authorities of states and their counties, districts and other political subdivisions, in carrying out the purposes of the act. Authority, however, is not granted to the personnel of the War or Navy Department or the Federal Security Agency to make criminal investigation, searches, seizures, or arrest of civilians charged with violations of this act.

PUBLIC WORK RESERVE

THE Public Work Reserve has been set up in the Federal Works Agency in Washington for the purpose of building a national "shelf" of public works programs that may be undertaken by local, state, and federal agencies in the post-defense period and which will include both capital improvements and public services. The Public Work Reserve will operate under the sponsorship of the Federal Works Agency and the co-sponsorship of the National Resources Planning Board, and, with the assistance of the Work Projects Administration, will prepare information, data and estimates which may be used in the establishment of a reservoir of public programs for the post-emergency period and to stimulate state and local governments and public and professional groups on these post-defense problems.

SYMPOSIUM ON INDUSTRIAL HEALTH AT THE MEDICAL COLLEGE OF VIRGINIA

THE second Symposium on Industrial Health, to be held in the Simon Baruch Auditorium at the Medical College of Virginia, September 11 and 12 has been announced by Dr. Fred J. Wampler, Professor of Preventive Medicine. There will be no registration fee.

Participating in the symposium, among others, will be Walter B. Martin, M.D., Norfolk, J. B. Porterfield, M.D., Richmond, E. C. Harper, M.D.,

Richmond, Russell R. Jones, M.D., Pittsburgh, W. J. McConnell, M.D., New York City, Louis Schwartz, M.D., Bethesda, Harry B. Stone, M.D., Roanoke, George H. Cross, M.D., Chester, Pa., Rudolph C. Thomason, M.D., Richmond, C. N. Scott, M.D., Nitro, W. Va., Professor Philip Drinker, Boston, John H. Foulger, M.D., Wilmington, Del., T. Lyle Hazlett, M.D., Pittsburgh, H. Page Mauck, M.D., Richmond, Murray B. Ferderber, M.D., Pittsburgh, Professor Donald E. Cummings, Denver, Colo., Thomas Beath, M.D., Richmond, Henry C. Marble, M.D., Boston, and Sumner L. Koch, M.D., Chicago.

SYMPOSIUM ON AIR-BORNE INFECTION

THE program of Section N of the American Association for the Advancement of Science, at the Chicago meeting, September 22-23, will be devoted to aerobiology. It is expected that the Symposium on Air-borne Infection and Its Control will be something of a milestone in the history of control of respiratory infection. Dr. Malcolm Soule is the Chairman. The program was organized in coöperation with the Committee on Aerobiology of the National Research Council.

HARVARD SCHOOL OF PUBLIC HEALTH

THE Department of Industrial Hygiene of the Harvard School of Public Health will give another short course in Industrial Hygiene similar to the one just finished for Naval Medical Officers. This will start with the opening of the school year, September 22, and will close a few days before Christmas. The course will be open to properly qualified engineers, as well as doctors. Tuition for this new course will be \$200.

PUBLIC HEALTH WORKERS IN DEFENSE

ONE hundred and thirty-four new public health workers have been assigned to state and local health de-

partments throughout the nation by the U. S. Public Health Service to assist states in coping with special public health problems created by the national defense program.

The new personnel completed the Public Health Service orientation course of one month at the National Institute of Health, Bethesda, Md., and are now on duty in the field. Forty-one physicians, 39 nurses, 51 sanitary engineers, and 3 laboratory technicians are included in the new personnel.

Congress has authorized the continuance of emergency defense and sanitation activities of the Public Health Service, and in addition has provided funds for training engineers for malaria control work in southern states. They will begin their training at the expanded field station at Norfolk, Va., with headquarters in the Norfolk Marine Hospital. The program will be conducted in coöperation with the Virginia State Department of Health.

TRAINING NURSES FOR NATIONAL DEFENSE

SURGEON GENERAL THOMAS PARRAN announced that active steps are being taken to alleviate the present acute shortage of qualified professional nurses vital to national defense. One of the first moves in this direction was the recent appropriation by Congress of \$1,200,000 for training nurses for national defense. These funds are being administered by the States Relations Division of the U. S. Public Health Service. They will be used for increasing the number of students in basic nursing education programs, in preparing inactive graduate nurses for active duty, and in offering postgraduate instruction in special fields of study.

Letters have been sent to all accredited schools of nursing in the country to determine how each can participate in the program of expanding the nation's nursing strength. Those plans

submitted by schools of nursing, hospitals, and other institutions concerned with the education of nurses which provide for the most effective increase of the best qualified nurses in the most economical way will be given preference.

The Public Health Service plan for administering the funds was endorsed by the three principal nursing groups working specifically on national defense, who convened in Washington for a 3 day conference early in July. They are the Sub-committee on Nursing of the Health and Medical Committee of the Federal Security Agency, which called the meeting with the Nursing Council on National Defense and the National Committee on Red Cross Nursing Service. They also drafted a master blueprint for mobilizing the country's nursing strength for the duration of the present unlimited emergency. An intensified program of nursing recruitment throughout the country was outlined by leading members of the nursing profession who were in attendance.

NATIONAL FOUNDATION FOR INFANTILE PARALYSIS

THE distribution by the National Foundation for Infantile Paralysis of new grants totaling \$195,030 with which to carry on its battle to conquer infantile paralysis was announced by Basil O'Connor, New York, President of the Foundation. The following grants have been made:

School of Public Health, University of Michigan, Ann Arbor, Mich.—\$40,000
 Tuskegee Institute, Tuskegee, Ala.—\$2,000
 Department of Pediatrics, University of Michigan, Ann Arbor—\$7,400
 University of Minnesota, Minneapolis, Minn.—2 grants totaling \$5,600
 University of California Medical School, San Francisco—\$4,250
 New York Orthopaedic Dispensary and Hospital, New York, N. Y.—\$1,750
 Hospital for Joint Diseases, New York, N. Y.—\$1,700
 New York Society for the Relief of the

Ruptured and Crippled, New York, N. Y.—\$1,000

National Organization for Public Health Nursing, New York, N. Y.—two grants totaling \$23,400

National League of Nursing Education, New York, N. Y.—\$8,500

Children's Hospital, Boston, Mass.—\$6,300

Massachusetts General Hospital, Boston, Mass.—\$2,500

Boston City Hospital, Boston, Mass.—\$3,000

Strong Memorial Hospital, University of Rochester, Rochester, N. Y.—\$9,200

University Hospital, The State University of Iowa, Iowa City—\$7,000

State University of Iowa—\$3,000

Michael Reese Hospital, Chicago, Ill.—two grants totaling \$7,930

Department of Surgery of the University of Chicago—\$720

Department of Bacteriology and Parasitology of the University of Chicago—\$4,980

Children's Hospital, Baltimore, Md.—\$400

The Johns Hopkins University School of Medicine, Baltimore, Md.—\$9,300

Department of Bacteriology of the University of Southern California School of Medicine, Los Angeles, Calif.—\$5,000

City Hospital, Cleveland, Ohio—\$5,300

Bureau of Laboratories, Michigan Department of Health, Lansing, Mich.—two grants totaling \$13,900

Connaught Laboratories, University of Toronto, Toronto, Canada—\$8,800

New York State Department of Health, Albany, N. Y.—\$12,000

AWARD OF MERIT TO PEORIA HEALTH OFFICER

THE Northwestern University Alumni Association has recently presented to Dr. S. M. Miller, Commissioner of Health of Peoria, Ill., an award of merit "in recognition of worthy achievement which has reflected credit on Northwestern University and each of her alumni."

Dr. Miller became Health Officer in 1935, since which time a reorganization of the Health Department has taken place with the establishment of an independent Public Health Board through legislative enactment and an independent tax authorization which has increased the revenue for the Health Department from 30 cents to 85 cents per capita.

PERSONALS

Central States

DANIEL C. BARRETT, M.D.,[†] Medical Director of the Health Unit at Washington, Iowa, has been appointed to a similar position with the Bloomington district of the Indiana State Board of Health, succeeding Dr. LEWIS C. ROBBINS,[†] who has gone to Washington, D. C., to join the U. S. Public Health Service.

OTTO K. ENGELKE, M.D., who for the past year has been a Fellow in Public Health Administration with the W. K. Kellogg Foundation of Battle Creek, Mich., has been appointed Director of the Washtenaw County Health Unit, Mich., effective July 16.

FLOYD M. FELDMAN, M.D.,[†] who has been Director of District No. 3 in the Minnesota State Department of Health, Rochester, has been appointed Health Officer of Rochester, Minn., succeeding Dr. THOMAS B. MAGATH of the Mayo Clinic staff.

JAMES B. GRIFFITH, M.D., Health Officer of Crawfordsville, Ind., has been appointed in charge of the Montgomery County Health Department, succeeding the late Dr. FRED A. DENNIS.

CECIL E. JOHNSON, M.D., Rensselaer, Ind., has been appointed Health Officer of Jasper County, succeeding the late Dr. ARTHUR R. KRESLER.

JOHN W. PAHMEIER, M.D., Sandborn, Ind., has been appointed Health Officer of Knox County, succeeding the late Dr. JOSEPH L. REEVE, Edwardsport.

RUSSELL P. REYNOLDS, M.D., Elizabethtown, Ind., has resigned as Health Commissioner of Bartholomew County, where he will engage in the practice of medicine at Garrett.

CLINT C. SOURWINE, M.D., of Brazil,

Ind., has been appointed Health Officer of Clay County to succeed Dr. JOHN M. PALM, Brazil, who has been called to army service.

HERBERT N. WALKER, M.D., of Evansville, Ind., has been appointed by the Board of Education of Hartford, Conn., as Director of Physical Education and Health Education. Dr. WALKER will succeed CHARLES C. WILSON, M.D., who has accepted an appointment to the staff of Teacher's College, Columbia University, New York, N. Y.

Eastern States

CLAUDE P. BROWN, M.D.[†] formerly Director, Biological Laboratories of the National Drug Company, Philadelphia, Pa., has been appointed Assistant Director of the Pennsylvania State Board of Health Laboratories, Philadelphia.

ARTHUR H. CUMMINGS, M.D.* formerly District State Health Officer with the New York State Department of Health at Binghamton, has been appointed Senior Surgeon, U. S. Public Health Service (R) and has been assigned to the Virginia State Department of Health and to act as Director of the City Health Department at Portsmouth, Va.

ESMOND R. LONG, M.D.,* Philadelphia, Pa., Professor of Pathology at the University of Pennsylvania School of Medicine, and Director of the Henry Phipps Institute, has been elected an honorary member of the Atheneum of the History of Medicine of Buenos Aires.

ELLA ROBERTS, M.D., has been appointed Medical Director of the Children's Health Hospital, succeeding Dr. OSWALD F. HEDLEY, U. S. Public Health Service, who served as acting director while making a survey of rheumatic fever in Philadelphia, Pa.

* Fellow A.P.H.A.

† Member A.P.H.A.

Southern States

W. D. BURKHALTER, M.D.,† formerly Associate Director of County Organization, Alabama State Health Department, has just been elected as Shelby County Health Officer at Memphis, Tenn.

JAMES W. CHAPMAN, M.D.,* who has been the Director of Maternity and Child Health with the Missouri State Department of Health, Jefferson City, since 1937, has resigned to become Director of District Health Department No. 3 for the counties of Antrim, Charlevoix, Emmet and Otsego in Charlevoix, Mich.

HUBERT D. CROW, M.D., Health Officer of Lawrenceville, Va., has been transferred to Southampton County.

SIDNEY FRANKLIN, M.D., M.S.P.H.,† has recently resigned as Health Officer of Butler County, Ky., to accept the position of Director of District Department of Health No. 6 in Michigan. This district comprises Luce and Mackinac Counties, with central office in Newberry.

FRANK M. HALL, M.D., Athens, Ala., who has been on leave of absence doing graduate work at Johns Hopkins University, will return as Health Officer of Limestone County.

JOSEPH HIRSH,† formerly with the U. S. Public Health Service and the Office of Education, has been appointed Social Economist in the Public Services Research Section of the Public Work Reserve in Washington. MR. HIRSH'S special responsibility will be in the welfare and health field where it is expected that a reservoir of useful and needed public programs for the post-emergency period will be set up.

RUTHERFORD O. INGHAM, M.D.,† Athens, Ala., has resigned as Health Officer of Limestone County to accept

a similar position in Johnson City, Washington County, Tenn.

ROSCOE P. KANDLE, M.D.,† Director of the Biparish Health Unit, composed of Winn and Grant parishes, has been appointed Regional Director of the northern district of Public Health in Louisiana, with offices located in Monroe.

ELISHA M. MOORE, M.D., of Centerville, Ala., is now Health Officer of Sumter County.

IVA G. MURPHY, M.D.,† has been appointed Health Officer of Greene County, Ala.

CHARLES L. SAVAGE, M.D.,† of Ashland, Va., has resigned as Health Officer of Hanover County to enter the field of industrial medicine. He will be succeeded by DR. JOHN D. HAMNER, JR.,† Courtland, formerly in Southampton County.

JAMES P. SHARON, M.D.,† has been appointed Director of Venereal Disease Control in the State of Nebraska, at Lincoln. DR. SHARON has been serving at Ft. Leonard Wood, Mo., and since 1936 has been connected with the Iowa State Department of Health.

CAPTAIN JAMES M. SUTER, M.D.,† formerly Health Officer of Bristol-Washington County, Va., has been ordered to duty with the U. S. Army and is now stationed at Fort Eustis, Va., Coast Artillery Replacement Center, and his position there is Post Medical Inspector. DR. JOHN G. McNIEL,† Bristol, formerly Health Officer of Montgomery County, will succeed DR. SUTER.

WILLIAM P. TERRY, M.D., Charlotte Court House, Va., Health Officer of Charlotte County, has been called to military service. His successor is DR. PAUL W. BOWDEN, Baltimore, Md., who has just completed a course in public health at Johns Hopkins University.

JOHN M. WALTON, M.D., who had been

* Fellow A.P.H.A.
† Member A.P.H.A.

associated with the Atlanta, Ga., Department of Health, has been appointed State Venereal Disease Control Officer. He succeeds DR. AARON WILSON BROWN.

MARY WALTON, M.D., Opelika, has been named Health Officer for Chilton County, Ala., succeeding DR. ROBERT W. CROWELL, Clanton.

DANIEL J. WILLIAMS, M.D., Gulfport, Miss., Health Officer of Harrison County since the unit was first established 26 years ago, retired from the position. He has been succeeded by DR. EVERETT W. RYAN, Charleston, Health Officer of Tallahatchie County.

HUNTINGTON WILLIAMS, M.D.,* Commissioner of Health of Baltimore, Md., left by air on July 12 for London, as one of a group representing the Office of Civilian Defense, Washington, D. C. According to the press DR. WILLIAMS said that he would specialize in first aid measures and in the rescue of persons from bombed buildings and the provision of medical care.

EMMETT J. YOUNG, M.D., Arcadia, La., Health Director of Bienville Parish, has been named to a similar position in Lincoln Parish, succeeding DR. NELSE P. LILES, JR., of Bastrop, who took over the Directorship of Health Units in Morehouse and Union parishes.

Western States

CHARLES W. ARTHUR, PH.B.,† who for 21 years has been Bacteriologist in the Pasadena City Health Department, Pasadena, Calif., has been appointed Acting City Health Officer to succeed WILTON L. HALVERSON, M.D., who has resigned to become County Health Officer of Los Angeles County.

WILTON L. HALVERSON, M.D.,* DR.P.H., Health Officer of Pasadena,

Calif., has been appointed County Health Officer of Los Angeles, Calif., succeeding DR. JOHN L. POMEROY,* deceased.

WILLIAM LEVIN, D.P.H.,* of Portland, Ore., Director of the Hygienic Laboratory of the State Board of Health for the past 18 years, has been called to military service.

JOHN R. SEELEY, M.D., has resigned as Health Officer of Coos County, Ore., to enter private practice.

Nassau, Bahamas

LAWRENCE W. FITZMAURICE, M.D., D.P.H.,† has been appointed acting Chief Medical Officer and Chairman of the Health Board of the Bahamas during the absence from the Colony of DR. JOHN M. CRUIKSHANK,† who is serving with the Royal Canadian Air Forces.

Canada

JOHN T. MARSHALL,* formerly Director of Vital Statistics for the Provincial Board of Health in Victoria, B. C., has been appointed Chief of Vital Statistics of the Dominion Bureau of Statistics at Ottawa.

DEATHS

DR. GEORGE PARRISH,* Los Angeles City Health Officer for the last 15 years, died on August 7 following an abdominal operation, at the age of 69. DR. PARRISH, who was a graduate of Washington University School of Medicine, St. Louis, after spending five years in the St. Louis Health Department, became Commissioner of Health of Portland, Ore., in 1917, serving until 1924.

HALSEY JAY BALL, M.D.,* Cape May, N. J., for many years associated with the New York State Health Department as health officer of various towns and district health officer, died May 31.

ALPHONSE LESSARD, M.D., Quebec,

* Fellow A.P.H.A.

† Member A.P.H.A.

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Present Status of the Venereal Disease Control Program in Mobilization and National Defense*

R. A. VONDERLEHR, M.D., F.A.P.H.A.

*Assistant Surgeon General, Division of Venereal Diseases, U. S. Public
Health Service, Washington, D. C.*

SINCE the beginning of the national defense program, two important events have occurred which relate to the control of the venereal diseases. The first of these was the mobilization under the Selective Service System, which makes possible, through the examination of a large representative portion of the manpower of the country, a much more exact determination of the prevalence of syphilis and which also presents an opportunity to bring a larger number of men infected with syphilis and gonorrhea under treatment than ever before in the United States. The second relates to the instructions by the Congress that the facilities for the control of the venereal diseases, developed as a civilian health program in the preceding years, be intensified and adapted to the new requirements created by the present mass movement of large population groups.

On the basis of preliminary reports from 41 states and territories, the pro-

gram of serologic blood testing for syphilis in the examination of Selective Service candidates has shown that among the first 950,000 men examined, approximately 50,000 had positive tests. In addition, the physical examinations of selectees before local Selective Service medical boards and Army induction boards have resulted in the rejection of substantial numbers of men with the lesions of early syphilis and with gonorrheal infections.

An attempt has been made to ascertain whether the selectees with positive serologic tests have been brought to physical examinations to clinch the diagnosis of syphilis, and, if so, whether they have been placed under treatment. This investigation shows that in most states existing epidemiologic and treatment facilities have been very inadequate. In the 20 states and territories which have reported on the follow-up of selectees, only 43 per cent have been brought in for physical examination, and less than 31 per cent have been classified as being under medical care for syphilis. No definite reports are

* Presented before the Conference of State and Territorial Health Officers in Washington, D. C., April 29, 1941.

as yet available on the follow-up of men rejected for gonorrheal infections, but there is every reason to believe that the follow-up and treatment services for these men are of a grade inferior to those rendered the men infected with syphilis.

These facts clearly indicate failure to develop an effective scheme for the follow-up and treatment of persons suspected of being infected with syphilis and gonorrhea. This situation is hardly surprising because reports from state departments of health at the beginning of the present fiscal year showed that only 65 per cent of the venereal disease clinics throughout the nation were provided normally with follow-up workers and the remainder did not employ even a part-time follow-up investigator. Only 15 per cent of the venereal disease clinics in the United States employed full- or part-time workers with some degree of special training in the principles of venereal disease epidemiology. In other words, at least one-half of the venereal disease clinics in existence at the beginning of the present fiscal year depended for contact tracing and case finding on part-time and untrained investigators, and two-thirds of the remaining clinics had no follow-up personnel. The present inadequacy of follow-up work not only in the general venereal disease control program, but as pertains also to the work connected with the Selective Service System, is chiefly due to failure properly to train personnel. It is also possible that the present system of generalized public health nursing is not effective because of an inadequate number of nurses employed and their limited experience in venereal disease control work.

The reports submitted by state health officers also show that in most instances there has been no clear-cut organizational procedure for reference back to Selective Service boards of men originally rejected for the venereal diseases

and subsequently rendered noninfectious by adequate therapy. This problem is especially acute as it relates to the deferment of selectees with gonorrhea, in whom, through the use of modern chemotherapeutic treatment, postponement of military service for a period of more than one month is extremely illogical. Routine procedures should be developed for the immediate return to the Selective Service boards upon the completion of treatment of all selectees deferred solely for venereal disease infections.

To provide effective facilities for all men found to be infected with the venereal diseases under the Selective Service System, the following plan is recommended:

1. The establishment of procedures for the follow-up of all selectees rejected for syphilis and gonorrhea, including the provision of treatment, the tracing and examination of their contacts, and the treatment of such of these contacts as are found to be infected.
2. The establishment of special investigators who will study the results of all examinations and laboratory tests performed on selectees to appraise the efficiency of follow-up service both for the selectee and for his contacts and to hold such infected persons under treatment until rendered noninfectious.
3. The organization of a procedure for reference back to Selective Service boards of men originally deferred for syphilis and gonorrhea and subsequently rendered noninfectious by adequate treatment.
4. The provision of sufficient trained personnel to insure effective contact tracing of alleged civilian contacts with gonorrhea and syphilis patients in the military personnel through a cooperative arrangement between all military medical and civilian health authorities.
5. The establishment of a program applying the above methods and technics to the specific problems of the control of syphilis and gonorrhea in industry and especially in the national defense industries.
6. The development of an effective educational program to inform the public and the armed forces of the need for adequate follow-up and treatment services and to discourage those who are infected from seeking treatment from quacks or other unlicensed treatment sources.

The progress reports submitted by state and territorial health departments, as of the first half of the present fiscal year, showed that more than 50 per cent of patients with syphilis who sought licensed medical care were in either the late or the late latent stages of this disease. In public clinics, less than 12 per cent of the total syphilis case load was composed of previously untreated patients who were admitted with primary or secondary syphilis. Since the major concern of the health department in the attack upon syphilis is the early, infectious patient, it is essential that everything possible be done to provide adequate treatment for such early patients and to discourage the attendance of patients with late and late latent syphilis beyond the time when adequate treatment has been given.

There is additional evidence from other sources to show that late and late latent syphilis now receives major attention in public clinics. Approximately 60 per cent of the antisyphilitic treatments given in such clinics were to patients with syphilis in these late stages.

In most clinics there is a tendency to devote far too much time to case holding of patients with late and late latent syphilis. So long as epidemiologic and treatment facilities are not utilized for the purpose of controlling early and infectious syphilis and gonorrhea, but to insure continuous care for patients with late syphilis, there will be insufficient follow-up and therapeutic services available to cope with the essential and fundamental public health problem. If a successful war is to be waged against the venereal diseases, every effort must be made to provide adequate treatment for all early infectious patients and to find and treat, if necessary, all contacts of patients in this category.

Experience in defense areas shows

that gonorrhea is the venereal infection which occurs with much the greater frequency. One gains the impression that this situation is due to neglect of this disease because the knowledge is available which would eliminate it as a public health problem within several years if a reasonably adequate program were developed. The Congress has also expressed a deep interest in the gonorrhea problem and has placed upon the Public Health Service the responsibility of developing a concerted national attack.

A marked rise in the number of laboratory tests performed to aid in the detection of gonorrhea and some increase in the number of persons under treatment by private physicians and public clinics offer a degree of encouragement for the future of the gonorrhea control program. The following measures should be intensified, however, to insure the greatest progress:

1. Provision of facilities for the clinical management of gonorrhea in all venereal disease clinics throughout the United States. It is still true that almost 30 per cent of the nation's venereal disease clinics do not admit patients with gonorrhea. This situation exists in spite of the fact that Section XV, paragraph 3 of the Regulations Governing Allotment of Venereal Disease Control Funds stipulates that "free diagnostic and treatment facilities for both syphilis and gonorrhea shall be provided by all health departments or clinics receiving funds under this Act . . ." If a larger percentage of the venereal disease clinics in the country do not change their policy materially with reference to gonorrhea, it may be necessary to prohibit the reallotment of federal funds to clinics which refuse to admit such patients.

2. There is considerable evidence to show that state and local health departments are distributing sulfonamide compounds which are already archaic.

Sulfanilamide especially should be replaced by newer sulfonamide compounds of much greater therapeutic efficacy. In the last two Conferences of State and Territorial Health Officers, you were informed that sulfathiazole was much more effective than any other sulfonamide compound which had been studied carefully up to that time. This situation still exists; yet, in spite of the proven efficacy of sulfathiazole for gonorrhea, only 200,000 tablets of this compound were reported as having been purchased and distributed by state health departments during the first half of the present fiscal year, as compared with $3\frac{1}{4}$ million sulfanilamide tablets. The Public Health Service has developed a system for rapid clinical appraisal of the efficacy of the new sulfonamide compounds, and these findings will be made available upon request to your state venereal disease control officer. Until the exact efficacy has been established of the numerous sulfonamide compounds available for the treatment of gonorrhea, health departments should purchase these compounds in quantities sufficient to last only for a period of from two to three months.

3. The need continues to exist for the development of facilities for the culture of the gonococcus in public laboratories. The culture remains the most efficient method for the determination of cure in this disease.

4. Many states regard the gonorrhea problem as being so unimportant that no progress records are available from them indicating the control measures against gonorrhea. In many other states the progress reports are meager and only incompletely made. Consequently it has been very difficult for the Public Health Service to obtain reasonably exact information as to the extent of the facilities and services available in the United States for the control of gonorrhea. Such progress records are important not only to determine the

progress which has been made from year to year, but also to ascertain the needs which now exist or which may arise in the future.

Immediate attention should be given to the utilization of educational and public relations technics and materials as a practical arm of venereal disease control, not only in areas of armed and industrial defense concentrations, but also with a view to laying a groundwork for the future program. The implications of this statement should be clearly perceived, for the future course of venereal disease control work may depend on the degree to which a sound educational and public relations program is carried on during these crucial days.

As an immediate step, the Public Health Service is substantially increasing its venereal disease educational services to the states. A consultation and advisory plan makes available trained workers who will collaborate, upon request, in the development of state and local activities. The production service makes available professionally written and designed publications, posters, exhibits, radio and motion picture materials at costs in comparison to results far below the capacity of any single state.

The Public Health Service is becoming increasingly concerned both with the quality of educational materials being produced by the several states, and with the organization of the educational programs. Studies recently made indicate a failure to appreciate many fundamental and practical pedagogical, public relations, and graphics factors in the preparation of publications, and a failure to adjust programs to changing conditions. To say this is to assess no blame. Perhaps not even in the more fortunately situated states and municipalities is it feasible to employ the necessary staff of trained and experienced persons to carry out a

program of both production and use.

The practical solution for production of effective materials would be to establish a coöperative relationship between the states and the Public Health Service whereby the facilities of all agencies could be utilized to the fullest extent.

The Public Health Service is in a position to make use of the finest talent available in the educational fields, and, as in other fields, will not hesitate to do so to aid the states better to do their tasks. It is prepared also to give full credit in the materials themselves to the various state departments of health. As you know, federal funds available under the Venereal Disease Control Act may be utilized for the purchase of educational materials produced by the Public Health Service, as well as to finance the production of educational materials in the state or local health department.

Faced with the problem of acute shortages of trained personnel, it is imperative that every effort be made to conserve our resources by assignment of tasks to those best qualified to handle them most economically and efficiently. It is recommended, therefore, that state health officers seriously consider the advisability of utilizing more directly and actively the venereal disease education consultative and production services of the Public Health Service.

Consideration should also be given to the more rapid development of broad

programs of public health education, utilizing materials produced jointly. Such activities would be of mutual benefit to venereal disease control and general public health, since the practical potentialities of health education in any specific field can only be realized through a comprehensive and integrated program.

In the interest of economy and greater efficiency, the Public Health Service, therefore, urges the development and adoption of a coöperative plan of general health education, which would be coördinated on federal, state, and local levels.

And finally two more recommendations are made for improvement of the entire venereal disease control program as it relates not only to invulnerable national defense, but also to its final successful prosecution throughout the United States.

1. Intensive training in the epidemiology of the venereal diseases of otherwise qualified new and old follow-up personnel, especially in contact tracing and case holding of patients with infectious or potentially infectious syphilis and gonorrhea.

2. The development of measures to discourage the present tendency of treatment sources to over-treat patients with late and late latent syphilis, especially when such treatment sources fail to provide adequate therapy and follow-up for patients with early infectious venereal diseases.

What the Navy Is Doing to Protect Its Personnel Against Venereal Disease*

F. R. LANG, M.D., DR.P.H.

Lieut. (Medical Corps) U. S. Navy, Assistant to Officer in Charge, Division of Preventive Medicine, Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

THROUGH the persistent efforts of modern medicine, most of the major disease scourges of mankind have been eradicated or controlled in the United States. By a progressive process of elimination, this hitherto large group of diseases has been narrowed down until tuberculosis, malaria, the pneumonias, and the venereal diseases remain as the leading ones. Of these, the venereal diseases have become the outstanding public health problem of the day, and consequently the greatest single challenge to the medical profession. In accepting this challenge there has developed among federal, state, and civilian health authorities a fourfold method of attack consisting of (1) public education, (2) prevention, (3) control, and (4) treatment. There are those who believe that any hope for complete eradication of the venereal diseases is mere wishful thinking. Nevertheless, by striving for this goal, the other points in any well organized venereal disease program automatically fall in line. The antivenereal disease program of the U. S. Navy follows the same broad general lines.

Each man in the military services is a citizen of our country. Every man in the Navy pursues one of two ulti-

mate courses. Either he returns to civilian life after a varying period in the naval service, or he chooses the Navy as a life career. If he elects to follow the former course, it is the moral obligation of the Navy to return him to civilian life a more useful citizen, free from disease, benefited by discipline and training, and with a better knowledge of hygiene, sanitation, and health. Should he choose the latter course, by virtue of his training and experience, he in time becomes of inestimable value as a key man in the work of his specialty and in training younger men for that specialty. The efficiency and effectiveness of this system vary directly in proportion to the nature and extent of the morbidity of the personnel of the Navy.

For years, gonorrhea has remained second and syphilis sixth among the leading causes of morbidity in the U. S. Navy. Modern preventive medicine has never accepted the timeworn and threadbare adage that "a case of gonorrhea is no worse than a bad cold," despite the fact that one hears of this saying continuing to be accepted among laymen in some backward and non-public-health-minded parts of our country. Setting aside the well known disabling effects of the complications of gonorrhea and syphilis, each infection with one of these diseases almost

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invariably represents a certain number of man-days of service lost to the Navy, and therefore a lowering of effectiveness.

The motto of the Medical Department of the Navy is *to keep as many men at as many guns, as many days as possible*. In upholding this maxim, the Surgeons General and entire Medical Corps of the Navy have always recognized that the prevention, control, and treatment of the venereal diseases are among their leading major problems and responsibilities. Some idea of the magnitude of the problem can be gained from the fact that during 1939 there were 16,277 admissions, and a total of 156,506 days lost on the sick list among Navy personnel because of venereal diseases. This is equivalent to having the entire complement of 79 new destroyers or 21 heavy cruisers or 11 battleships infected with venereal disease at some time during that year. In terms of man-days lost, the total sick days charged to venereal disease during 1939 would be equivalent to having the entire crew of two modern destroyers on the sick list every day during the entire year.

The Navy recognizes that among its greatest responsibilities are the physical, moral, spiritual, and intellectual development and guidance of the young recruit. He is uprooted from a sheltered home environment and abruptly transplanted into service life, where, after a comparatively short period in a training station, he may be sent to some ship or station in a foreign land. Here he may find social and economic standards, religious beliefs and moral outlooks widely divergent from those of the environment in which he has been reared. Oftentimes before these young men can adjust themselves they may find themselves literally surrounded with conditions of vice where all of the social and moral restraints of American civilization are lacking, and where an entirely different outlook pre-

vails. These are not casual theories but are observations based upon statistical analyses. The venereal disease rates in the Navy are the highest among personnel on Asiatic duty. A recent 10 year study of gonorrhea in the Navy reveals that the rates of practically all ships and stations outside of the continental United States are in general higher than are those within the continental limits.

Preventive and protective measures in the Navy begin at the recruiting stations, through the processes of selection and screening. From 1929 until the present emergency, the U. S. Navy has had more applicants than were needed to fill the vacancies in its complement. From among these applicants, every effort has been made to select the higher type of individual, with the best educational, sociological, and economic background. As a result, during this period, the Navy has been able to procure an excellent type of recruit. It is felt that this fact has played a part in the reduction of venereal disease during the past 10 years.

At the recruiting stations, all applicants who show any evidence of being infected with venereal disease are rejected. Routine blood serological tests for syphilis are done on all new recruits. Those having repeatedly positive tests are rejected.

In the training stations, the men are educated in sanitation, group hygiene, personal hygiene, and sex hygiene by means of lectures, lantern slides and moving pictures. The value of continence is stressed; the hazards of illicit intercourse are pointed out. The dangers of consorting with prostitutes, in increasing the chances of acquiring venereal disease are emphasized. The seriousness of syphilis and its effect on the future life and health of the individual infected are stressed.

During the training period, every

effort is made to assist the newly inducted recruit in adjusting himself to this unaccustomed environment and entirely new mode of life. The fact is recognized that he has been transplanted from a home environment, wherein he has had very little or no contact with the sordid side of life. His conceptions of womanhood have been formed in a protected home environment. From these surroundings he is transposed to a masculine world of strict military discipline. However, by contrast, while he is on leave or liberty in this new world, he finds himself in a strange city, personally unknown to the local citizens. Here he tastes a type of freedom entirely new. Should he so desire he is at liberty to cast aside all of his ideas of morals and social conventions which have been built up by family ties during his more formative years. He soon realizes that such a course, should he choose it, does not carry with it the danger of opprobrium, social disgrace, and scandal which normally would be his lot were he in his home surroundings. Add to this his immaturity (the average age among new recruits in our Navy is about 20 years), and there exists a perfect combination of circumstances wherein the new recruit may fall an easy prey to the wiles of prostitution, or to any other form of vice. This is the most dangerous period of his Navy career from the viewpoint of possibility of exposure to and danger of contracting venereal disease. These statements are not mere theories, but are borne out in the cold light of statistics. In the recently completed 10 year study of gonorrhea in the Navy it was seen that the highest rates for this disease occur: (1) during the period of the first enlistment, and (2) in the age group 20-24 years. Among the men who are more mature both in age and in years of service, there are correspondingly lower rates. Hence, the neces-

sity for emphasizing venereal control measures among (1) the personnel on foreign service, and (2) the younger men in their first enlistment period is recognized.

Could the Navy prevent, reduce, or control the problem of prostitution, its antivenereal disease campaign would be greatly simplified. It is generally recognized that the prostitute is the principal source of venereal disease. Under our American system, the responsibility for measures for the suppression of prostitution does not come under the direction of military and naval authorities. This is a function of the local police and health authorities. Unfortunately there is no uniformity of effort or method. Interest in, and intensity of activities vary with the amount of funds available, with the presence or absence of trained personnel, and with local public interest in the matter. If the local community is unfortunate in having political interference in its police and public health activities, or, even worse, to have graft and corruption involved, then the situation becomes infinitely worse from the viewpoint of curbing prostitution. Under such circumstances, much of the benefit to be expected from the venereal disease control program of the Navy is nullified.

Hence we see from experience, observation, and statistics that it is while the new recruit is undergoing his readjustment to military life, during the early part of his first enlistment, and before he has had an opportunity to weigh and consider a new set of values that he is most likely to contract venereal disease.

For years, it has been recognized that the weakest point, in so far as the venereal disease program is concerned, has been the loss of control over the men during their off-duty periods, while on leave or liberty. In the past, the attitude was held that during such periods, a man's time was his own, and

what he did on his time away from his ship or station should be no concern of the military authorities so long as he did not run afoul of the civilian police authorities; furthermore, that any attempt to intrude upon or to regulate his activities, would be an infringement upon his personal rights as a citizen of our democracy. Later this viewpoint was modified with regard to venereal control measures. It is a sad commentary that such a paradox should exist, wherein on one side of the picture, while on duty, the Navy man is surrounded with and protected by every known means of safeguarding his health, the cost of which represents a considerable investment, while, conversely, when he leaves his ship or station on liberty he all too frequently is exposed to, and victimized by a depraved and sordid group of exploiters, who care nothing for his health, and whose only concern is the profit to be gained from their illicit and degrading enterprises. Fortunately, public opinion has been awakened, thanks to the excellent work in this field of agencies, such as the U. S. Public Health Service, the American Social Hygiene Association, the American Medical Association, and the American Public Health Association. Despite the excellent progress made, it is believed that the American public has not yet been aroused sufficiently to appreciate fully the gains that may be made by their coöperation in the field of sociology, especially with regard to the armed services. This they can do by displaying a friendliness toward, and by taking an interest in, the service men in their midst, for much of the success in providing wholesome recreation and entertainment for the Navy men depends upon their interest in these matters. Aboard ship and at shore stations, every possible healthful diversion is provided for the men while not on duty. However, it is a well recognized fact that keeping

the men aboard too long is not good for morale. Being human, they long for feminine company, and being young and healthy, they have a zest for new sights and experiences and adventures.

The Navy is doing everything possible to coöperate with and to encourage the admirable work being carried on by the various agencies fighting the spread of genito-infectious diseases. It is true that public interest has been partially aroused. However, American public sentiment must be brought to the realization that the venereal disease question in the Army and the Navy is not purely a problem within the services. Not only is it one which reflects local vice conditions, but it is also a problem which affects, either directly or indirectly, the health and well-being of the entire nation. This is especially true in time of national emergency, when the Army and Navy must be increased to a size many times their peacetime strength; later to be reduced to peacetime needs. The Navy would like to see the American public educated to realize: (1) that each case of venereal disease in the services has its origin in the civil population; (2) that prostitution flourishes uncontrolled, is controlled, or is stamped out only by the weight of local public opinion existing in the civilian populace; (3) that the activity and efficiency of the local health and police agencies in controlling venereal disease are directly dependent upon the degree of interest shown by the citizens in these agencies; and (4) that the personnel of the armed services are not strangers and outsiders in their midst, to be treated indifferently, but are their own fellow citizens, yes, in many instances, their own brothers, sons or kin.

Civic, church, patriotic, and women's organizations, as well as civilians in general, should be awakened to the realization that they are patriotically and morally obligated to take an in-

terest in the service man while he is off duty, and to provide him with wholesome diversions and with social activities wherein he will meet the proper type of feminine company. It will then be seen that by taking such an interest, conditions will automatically become less favorable for the prostitute and other forms of vice to attract the service man. The public spirited citizen should be educated to appreciate that a disinterested or indifferent attitude toward the younger service man will result in his being surrounded by a vicious group seeking to exploit him, and tempting him with all of the wiles of prostitution to fill in his idle time while he is off duty. It is with these facts uppermost in mind that naval authorities are attempting to arouse the interest of local civilian authorities and organizations.

If, by his behavior while on liberty, a Navy man deliberately subjects himself to the possibility of contracting a disease which results in a loss of man-days and efficiency to the Navy, then his conduct under these circumstances should be of concern. As one method of approach to this angle of the venereal disease problem, stringent disciplinary measures were established in the early part of this decade. Under these, a man who contracted venereal disease and who had not taken prophylaxis or one who deliberately concealed venereal disease was by regulation required to be given a court-martial. Also by regulation, a man's quarterly proficiency marks in his rating were required to be lowered so as to preclude temporarily the possibility of advancement.

Following the institution of these measures, the venereal rates began to drop. One had but to observe the increase in practice of civilian physicians in Navy ports to realize what was happening. It was apparent to the enlisted man that it meant far more to the future of his career in the Navy to

attempt to conceal his venereal disease and to be treated ashore, rather than to report to his medical officer. The net result of these measures was to drive venereal disease underground and to increase attempts at concealment. This in turn resulted in irregularity and inadequacy of treatment of the concealed cases and a consequent increase in complications. These disciplinary measures had a marked deleterious effect on morale, since they tended to create a lack of confidence among the men in their officers, who were required by regulations to subject them to disciplinary action. Commanding officers and medical officers soon realized the unfairness of punishing men for the misfortune of becoming infected, while men equally as guilty of exposure to venereal disease, yet who either did not become infected, and therefore were not detectable, or who, becoming infected were able to conceal their infection, escaped punishment. It was as a result of these observations that many of the disciplinary measures were revoked. The Navy has come to realize the futility of attempting to lower venereal disease incidence by disciplining the infected individual. Today, the only court-martial offenses are: (1) deliberate concealment of venereal disease, and (2) going absent without leave when confined to ship or station during the infectious stage of the disease, because, as one measure of control, a case of venereal disease is confined to his ship or station during the communicable stage. Punishment for failure to take prophylaxis as a control measure was determined to be impracticable for the same reasons.

Throughout the Navy frequent inspections of personnel are held to search for concealed venereal disease cases, because deliberate concealment is looked upon as a major crime, owing to the close living conditions. The frequency with which inspections are

made, as a measure of control, is a matter which is left to the discretion of the commanding officer who is usually guided by the recommendation of his medical officer. In addition, throughout the Navy, an inspection of food handlers is conducted once a week, which is very thorough and includes inspection for venereal disease.

It is true that some of the enlisted men do not think about the future in a practical way. Some men cannot be made to feel that, should they become infected, the serious consequences of venereal disease often observed in their shipmates are likely to happen to them. The information that the serious effects of syphilis not infrequently become manifest in later years in the form of hopeless lesions in the cardiovascular and central nervous systems makes little impression upon the irresponsible type of individual.

It is for these reasons that the Navy man is subject to a constant repetition of instruction in personal and sex hygiene, and in the possible ill effects of syphilis upon future life, health, and happiness.

Since 1909, naval authorities have considered chemical prophylaxis an important part of their program to curb venereal disease. In the instruction in sex hygiene repeatedly given to the men, the purpose and value of chemical prophylaxis are included. It has been learned by experience that a good number of the men are incapable of self-administering chemical prophylaxis thoroughly. Because of this, it has been the policy to provide trained hospital corpsmen to supervise and instruct in the administration of this type of prophylaxis. In Navy ports whenever there are large concentrations of ships, first aid stations are established ashore. Each of these has a prophylaxis unit. Here a record is kept and copies are provided for the medical activity concerned.

In port, the Navy provides its own police force ashore, known as the Shore Patrol. In general, it is charged with the maintenance of order among Navy personnel. The Shore Patrol also functions indirectly as a public health unit in that (1) it may be directed to place certain sections of a city known to contain brothels, or specific houses of prostitution, out of bounds to naval personnel, and (2) it may return men, who are obviously incapable of taking care of themselves, to their ship or station.

Navy prophylactic materials and technic are standardized. At the Naval Medical Center in Washington, constant and continuous research is being conducted in an effort to improve upon or discover a better technic or an improved ointment for venereal disease prophylaxis. In the technic of prophylaxis as outlined to the men, the following steps are insisted upon: (1) to take chemical prophylaxis as soon after exposure as possible; (2) to urinate; (3) to wash exposed parts thoroughly with soap and water; (4) to instil colloidal silver solution into the anterior urethra, and to retain it there for at least 5 minutes; (5) to apply a special Navy calomel ointment thoroughly to all exposed parts.

Unlike the civilian, the Navy man is compelled to undergo treatment for venereal diseases, and his treatment is closely supervised by medical personnel highly trained in the therapeutics of these diseases. In addition to conducting its own research and studies, the Navy Medical Department observes closely all advancements and developments in methods of venereal disease treatment. These, when proved and accepted are added to the Naval doctor's armamentarium. One of the more recent venereal disease control measures utilized by the Navy, is that of coöperation with the local police and health authorities. This has proved to be

mutually helpful. Whenever this information is procurable, Naval medical authorities are required to report to local health authorities sources of venereal infection and the names of civilians who have been reported as exposures to a known Navy case. In many parts of the country the local health authorities report Navy exposures to known civilian cases. Coöperation of this nature is variable but contributes some part to control, both in the local community and in the local Naval unit.

Every known case of venereal disease in the Navy is recorded in the health record of the individual infected. Luetic cases have a special form provided which becomes part of the man's health record. Entries include diagnosis, treatment, progress, complications, reactions, and blood serology. Every case is reported centrally to the Bureau of Medicine and Surgery on a statistical form provided for reporting all diseases and injuries, and special reports on arsenical reactions are submitted quarterly. This information is transposed to punch cards for machine tabulation and statistical analysis. The venereal disease problem of the Navy is constantly being observed and studied under varying naval conditions. Special reports on the genito-infectious disease conditions in civilian communities in the neighborhood of naval activities are received and incorporated as part of the Force Surgeon's report and of the Sanitary Reports from various medical units afloat and ashore.

The subcommittee on venereal diseases of the Committee of Medicine, National Research Council, on which the services are represented, is now working on standardized forms for reporting venereal diseases. Should they be adopted, the way will be paved for uniformity of reporting, analyzing, and comparing venereal disease statistics, for broader centralized recording of in-

formation relating to the effectiveness of various drugs used, and for providing uniform mass information on the circumstances under which an infection was acquired. It is hoped that these forms will be adopted by the Army, Navy, U. S. Public Health Service, the coöperative clinics, and other clinics.

In September, 1940, representatives of the Surgeons General of the U. S. Public Health Service, Army, and Navy published a joint agreement setting forth a plan for *Co-operation of the U. S. Public Health Service in Extra-military Sanitation*. This agreement has been approved by the Administrator of the Federal Security Agency, the Secretary of War, and the Secretary of the Navy. In it is incorporated a joint program which it is believed will assist in reduction of the spread of venereal diseases. Briefly the agreement is as follows:

"It is recognized that the following services should be developed by the state and local health and police authorities, in coöperation with the Medical Corps of the U. S. Army, the Bureau of Medicine and Surgery of the U. S. Navy, the U. S. Public Health Service, and interested voluntary organizations.

"1. Early diagnosis and adequate treatment by the Army and Navy of enlisted personnel infected with venereal diseases.

"2. Early diagnosis and treatment of the civilian population by the local health departments.

"3. When authentic information can be obtained as to the probable source of extra-marital venereal disease infection of military or naval personnel, the facts will be reported to the state or local health authorities as may be required. If additional authentic information is available as to the extra-marital contacts with diseased military or naval personnel, during the communicable state, this should be reported.

"4. All contacts of enlisted men with infected civilians to be reported to the Medical Officers in charge of the Army and Navy, by the local and state health authorities.

"5. Recalcitrant infected persons with communicable syphilis or gonorrhea to be forcibly isolated, during the period of communicability; in civilian populations it is the duty of the local health authorities to obtain the

assistance of the local police authorities in enforcing such isolation.

"6. Decrease as far as possible, the opportunities for contacts with infected persons. The local police department is responsible for the repression of commercialized and clandestine prostitution. The local health department, the state health department, the U. S. Public Health Service, the Army and the Navy will coöperate with the local police authorities in repressing prostitution.

"7. An aggressive program of education both among enlisted personnel and civilian population regarding the dangers of the venereal diseases, the methods for preventing these infections, and the steps which should be taken if a person suspects that he is infected.

"8. The local health and police authorities, the state department of health, the U. S. Public Health Service, the Army and the Navy desire the assistance of representatives of the American Social Hygiene Association or affiliated social hygiene societies or other voluntary welfare organizations or groups in developing or stimulating public support for the above measure."

It is an accepted fact that one of the most important single steps which will materially decrease the possibility of exposure to venereal disease is the providing of adequate diversions such as moving pictures, entertainments, dances, athletic contests, and sightseeing trips during recreational time. It has been observed that the venereal disease rates in the various subdivisions of the Navy vary inversely as these diversions are present. It is a regrettable fact that in many locations of foreign duty, prostitution and vice are found widely prevalent and the availability of space and facilities for healthful diversions are limited or actually restricted.

In summation, it is believed that the combination of youth, inexperience, freedom from possibility of censure for violating social conventions, contact with prostitution and other forms of vice before having evaluated the seriousness which venereal disease may mean to future life, and lack of sufficient healthful forms of diversion are the factors responsible for the venereal disease problem in the U. S. Navy today.

CONCLUSION

In concluding it might be well to emphasize that venereal diseases are preventable, that they are acquired from civilian sources, and that prostitution is the chief source of infection. While many aspects of the venereal disease control program in the Navy are medical, much of the work comes under the headings of discipline, recreation, athletics, and social service. Undoubtedly, further success can be attained by additional coöperation on the part of civic, patriotic, veterans, church, and women's organizations who are interested in the diversions and welfare of service personnel.

It is believed that greater success can be derived by concentrating greater efforts on the sociological phases of the problem.

NOTE: The opinions and assertions expressed herein are those of the writer, and are not to be interpreted as being official or as reflecting the views of the Navy Department or of the Naval service at large.

Immunity and Positive Tuberculin Reaction

LEOPOLD BRAHDY, M.D.

New York, N. Y.

THE majority of people infected by the tubercle bacillus never become ill, do not show any symptom or sign of tuberculosis except that all react positively to a tuberculin skin test; they are "positive reactors." In this way they may be differentiated from other apparently healthy people who have never been infected by the tubercle bacillus because without infection a positive tuberculin reaction to standard dosage is not possible. Such individuals may be called "negative reactors" or, better, "non-reactors." A few people lose the positive reaction in the course of years¹ but in the great majority of cases if the test is once positive, it continues positive throughout life. The complete loss of the positive reaction in an individual indicates that the primary infection is completely healed, usually by calcification. Such an individual may again acquire a new infection.² This second infection will have all the pathologic characteristics of a primary infection, and the tuberculin reaction in that person will again become positive. Until the early years of this century almost everyone acquired the primary infection before 18 years of age, and even today most adults in cities have at some time or other had a tuberculous infection, as evidenced by a positive tuberculin test.

In the last few decades an increasing number of young people reach the

age of 18 without infection.³ In a group of students, many of whom came from sparsely settled areas, as high as 76 per cent tuberculin non-reactors has been found.⁴ Among the young women enrolling for nurses training in New York municipal hospitals about 45 per cent are non-reactors, and 55 per cent are positive reactors.

The epidemiologist anticipates the day when no one acquires any primary infection, which will be indicated by a population of non-reactors. Only then will the number of people becoming ill with tuberculosis be reduced to zero. Until that time arrives and, indeed, to hasten its arrival, it is important to determine the effect of the primary infection on this vast majority of people who do not exhibit clinical tuberculosis as a sequel to this primary infection.

Can such a person subsequently develop clinical tuberculosis by again inhaling tubercle bacilli disseminated by a tuberculous patient? Does the primary infection produce any change in susceptibility or resistance to subsequent exposure to tuberculosis? Experimentally, superinfection can be effected.¹⁰ On what evidence can we determine susceptibility or resistance in human beings?

The best evidence would be diligent observation of a group of positive tuberculin reactors. Anyone showing any evidence of clinical tuberculosis at the

beginning of the observation period must be excluded. All members of the group must be exposed to infection sufficiently often and in a manner capable of causing infection in those without immunity. If, under such circumstances, the tuberculosis morbidity in this group is high, we may conclude that the new exposure is responsible for the disease. Such a result means that a new or "superinfection" has occurred—that the positive tuberculin reaction does not indicate any immunity from exogenous reinfection or superinfection. If the morbidity is lower than that expected for that age-sex group, then the intense reexposure does not cause disease. Such low morbidity means that the positive tuberculin reaction is an indication of resistance against the new infection, or, phrased in another way, exogenous reinfection does not occur. As tuberculous disease develops solely in those who are tuberculin positive, a few cases of clinical tuberculosis are to be expected among positive tuberculin reactors even though there is no new exposure whatsoever.⁴ If, therefore, the morbidity is very low in this group intensively exposed, we may conclude that positive tuberculin reactors have developed resistance which is equivalent to complete immunity to new exogenous infection.

GROUP OF POSITIVE TUBERCULIN REACTORS

In a period of 5 years, 1,320 young white women in good health, with positive tuberculin reactions, aged 17 to 23, trained in four nurses' schools of New York City hospitals. They are in the age group in which the tuberculosis morbidity for women is at its peak.⁶

Each member of the group, on enrollment, had a roentgenogram which showed no clinical tuberculosis. Those who showed any parenchymal lesion on this first film are not included in

this group. Additional films were taken every 6 months or oftener. Of these girls 92 per cent reacted positively to the first dose tuberculin test (0.1 mg. OT or 0.00002 mg. PPD). The other 8 per cent were positive to the second dose only (1.0 mg. OT or 0.005 mg. PPD).

WAS THE EXPOSURE SUFFICIENT TO INFECT?

All of these student nurses worked on the wards of the city hospitals where patients with pulmonary tuberculosis are frequently admitted and remain until diagnosed. Most of these nurses also worked from 4 to 8 weeks on wards exclusively for tuberculous patients.

Would such exposure be sufficient to infect a susceptible person? Heimbeck⁷ in Norway and Holm⁸ in Denmark showed that almost all pupil nurses who are non-reactors to tuberculin before beginning their course of training become infected and are tuberculin-positive before the end of 3 years. A number of investigators⁹ have shown that the situation is the same in this country.

Enrolled together with our group of 1,320 tuberculin-positive reactors was a second group of 910 non-reactors from the same social and economic section of the population. The two groups, positive reactors and non-reactors, lived together, were assigned the same work, ate the same food. No two groups could be more nearly identical in physical characteristics, manner of life, and exposure to tuberculosis infection. These non-reactors are therefore an ideal control group. About one-half of them had been negative to both first and second dose tuberculin test. The other half was negative to the first, but the second was not done. About two-thirds of them were re-tested with tuberculin within 3 years. Over 85 per cent usually become infected by tubercle bacilli in the course of training,

as shown by the change from negative to a positive tuberculin reaction. Periodic roentgenograms of these (originally) non-reactors revealed 34 cases of tuberculous lesions—28 parenchymal and 6 pleurisy with effusion, an incidence of about 3.7 per cent. The result of the exposure on these non-reactors therefore establishes the fact that this exposure was sufficient to infect those susceptible to the disease.

OBSERVATION OF THE TUBERCULIN-POSITIVE REACTORS

Periodic roentgen examination of the 1,320 girls who had positive reactions upon enrollment revealed six lesions—5 parenchymal and 1 pleural effusion—an incidence of less than $\frac{1}{2}$ per cent. Demonstrable lesions occurred 8 times as frequently among the originally tuberculin non-reactors as among the positive reactors.

CONCLUSION

Under the living conditions of student nurses, a positive tuberculin reaction may be considered an indication of immunity to re-infection through contact. There is no evidence to indicate any activation of old primary infection by new exposure. Tuberculin allergy and immunity to new infection are two biological phenomena which may be separated experimentally, but in man they exist together.

COMMENT

This conclusion implies no new principles in immunology. Syphilis and other diseases are known to exhibit similar immunological properties. For example, a 48 year old chauffeur gave a history of having had a chancre at the age of 18 which disappeared, leaving no visible scar. He thereafter lived an active life in good health, during which he had several negative physical examinations. Now, at the age of 48, he presents a gumma. We accept the

fact that his infection remained latent 30 years, giving no physical signs and insuring immunity to any *new* infection with syphilis. We do not charge his gumma to superinfection or re-infection. We know that if his syphilis is completely cured he is again susceptible to new infection. The only immunological difference between latent syphilis and latent tuberculosis following primary infection is this: among syphilitics most will have serious disease in later life, whereas among persons harboring tubercle bacilli, a minority develop clinical disease. In both diseases primary infection confers immunity to new exogenous infection. It is important for the syphilitic to know of his infection in order that he may have treatment to rid him of the infecting organism. But in tuberculosis it is also important to know of a primary infection in order that he may have a roentgen chest examination, to determine if he has any disease, and that fear of infection may be allayed through new contact with tuberculosis in family, social, or occupational activities.

IMPLICATIONS

The following are practical implications:

Doctors, nurses, attendants, and students who are tuberculin-positive need not fear tuberculosis because of their work.

A tuberculosis patient is not a source of infection for adults of his family who are tuberculin-positive reactors.

In hospitals and sanatoria there is no evidence that tuberculous patients infect one another. An ex-patient may be employed by a tuberculous hospital with safety to himself as far as activating his own lesion or acquiring new infection is concerned. A program for the prevention of tuberculosis among nurses or any other group must start and also end with prevention of infection of tuberculin non-reactors.

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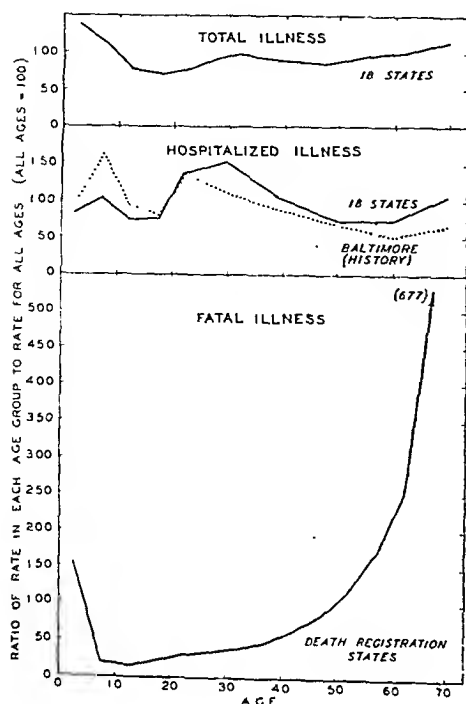


FIGURE 2—Relative variation with age in total, hospitalized and fatal cases of illness per 1,000 population—illness and hospital data from survey of 8,758 white families in 18 states, 1928–1931; hospital cases among 2,019 living white families in the Eastern Health District, Baltimore, in 8 hospitals, 1926–1935; mortality data for white population of Death Registration States, 1929–1930.

of the rate at each age to that for all ages is used to indicate relative increase and decrease.

Inspection of the age curves for total hospitalized and fatal illness shows large differences. Total morbidity rates are highest for young children, then decline consistently to a low for the age periods through 19 years. From 20 through 45 years of age there is a wave reaching its crest in the early 30's. After 45 the sickness rates show an uninterrupted increase but never reach as high a figure as that for the youngest age group. Hospitalized case rates are low for children under 5 years, have a marked peak at the early school ages, level off for the years 10 through 19,

and then show for the childbearing ages a very much more marked incidence than do the figures for total sickness. The increase of the rates with age is not evident until age 60. The age curve for deaths starts off with a high rate for infancy followed by a consistent drop to its lowest rates at 10–14 years. There is then comparatively little variation up to 45 years of age, when a sharp rise is evident, culminating in the extremely high mortality of old age. These three age curves have little in common except comparatively low rates for older children. Both sickness and death show high rates for infancy and old age; but the highest incidence of total illness occurs under 5 years, whereas that of hospitalized illness is between 20 and 40, and that of fatal illness after 60 years of age.

HOSPITAL CASES WITH AND WITHOUT SURGERY

In Figure 3 admissions for causes relating immediately to delivery and the puerperal state are excluded. The historical study on residents of the Eastern Health District shows that the incidence of cases treated with surgery is greater at every age. The rates for white males and females of similar ages are about the same. The high childhood peak is very striking for the surgical cases, and the nonsurgical cases show, in general, less variation with age. Both show an increase for the oldest age group. Comparable data from a group of surveyed families in 18 states show similar variation with age and an excess of surgical cases.

FREQUENCY OF CAUSES OF ILLNESS

The five most frequent causes of all sickness, of hospitalization, and of death are notably different. Figures for total and hospitalized illness can be obtained from Costs of Medical Care studies and, for deaths, from the mortality statistics of the U. S. Death

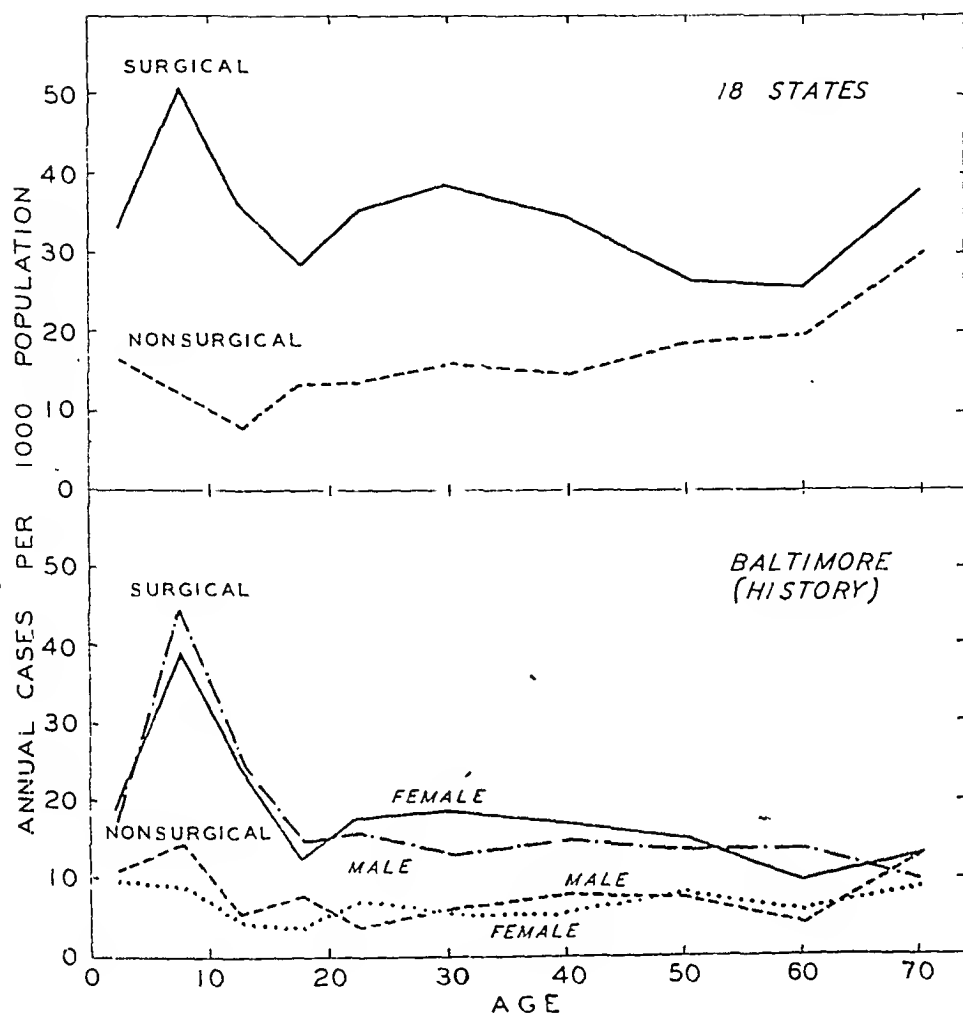


FIGURE 3—Annual admissions (excluding puerperal cases) with and without surgery, per 1,000 population, by age—8,758 white families in 18 states, 1928-1931 and 2,019 living white families in the Eastern Health District, Baltimore, in 8 hospitals, 1926-1935.

Registration States in 1929 and 1930.

The relatively small variation of the total sickness curve with age ties in with the diagnoses indicated as the five most frequent causes of morbidity. They were colds and bronchitis (18.2 per cent of the total number); influenza, grippe, and pneumonia (10.9); accidental injuries (8.8); "sore throat" (6.0); and digestive disorders (4.7). Together, they caused about one-half of all sickness. Each of these groups of diseases attacks persons of all ages

with somewhat similar frequency. Even though the survey technic may tend to minimize the importance of minor disorders, colds and bronchitis together caused nearly one-fifth of all reported illness. The outstanding place of respiratory diseases is evident, with three of the five leading causes coming under this classification.

The most frequent causes of hospitalization were tonsillectomy (26.5 per cent); all deliveries (15.5); accidental injuries (8.7); appendicitis (8.0); and

female genital diseases (4.6). Over 60 per cent of admissions were due to these causes.

The age curve for hospital cases showed a peak for ages 5 through 9, with its highest rates from 20 to 40 years. The high childhood incidence was apparently a reflection of admissions for tonsillectomy, which constitute more than one-fourth of all hospital cases. The importance of childbirth and the female genital diseases accounts for the wave in the sickness curve, covering the age period from 20 to 40 years.

The leading causes of fatal illness were diseases of the heart (18.8 per cent); influenza and pneumonia (10.4); malignant neoplasms (9.2); nephritis (7.8); and cerebral hemorrhage (7.5), which together caused over 50 per cent

of all deaths. Four of these five are degenerative diseases. It will be remembered that the age curve for deaths showed extremely high rates for the older age groups. In 1938, the latest year for which United States mortality figures are obtainable, the same five disease groups were the most frequent causes of death, but malignant neoplasms had risen to second place, and influenza and pneumonia had dropped to third.

Accidental injuries stood third in frequency as a cause of all sickness and of hospitalization in 1928-1931. They were the sixth most important cause of death, for 1929-1930. Influenza and pneumonia were second as causes of sickness and also as causes of death, but they were far down the list of hospitalized illness.

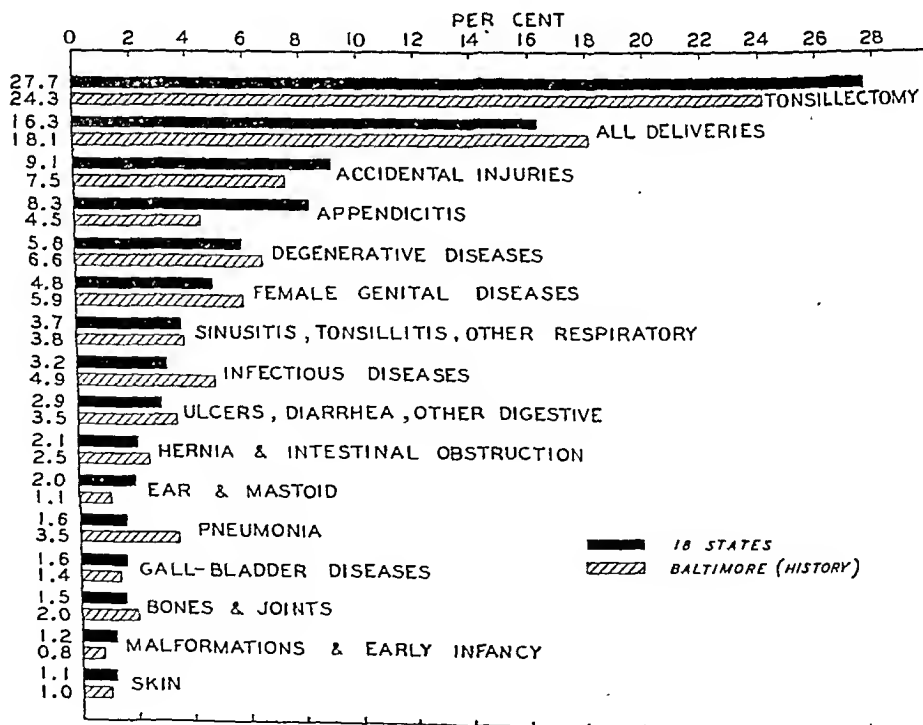


FIGURE 4—Percentage of all hospital cases with specified diagnosis—8,758 white families in 18 states, 1928-1931 and 2,444 living white and Negro families in the Eastern Health District, Baltimore, 1926-1935.

The relative position of maladies in addition to the five of leading importance may be seen in Figure 4, which shows the diagnoses on hospital cases as obtained from unpublished data for a group of surveyed families and from the Eastern Health District study. These come in the one case from reports obtained from urban and rural white families for a 12 month period in 1928-1931, and in the other from hospital histories found as the experience of an urban, living population of both races for 1926-1935. The agreement is, however, rather striking.

Tuberculosis and mental diseases have been excluded from both as the Eastern Health District study did not include persons in institutions for these diseases. The causes are arranged in order according to magnitude for the data of the former study. It may be seen that with the exception of a few differences such as for appendicitis and the group of female genital diseases, no great disagreement is noted.

Most of the disease titles are self explanatory. The degenerative group includes in the order of their importance, diseases of the kidneys and bladder, neoplasms, diseases of the heart, diabetes, arteriosclerosis and cerebral hemorrhage. The infectious group includes the common communicable diseases of childhood, together with the venereal diseases and local infections. Scarlet fever and diphtheria were considerably more numerous than others in this group.

SUMMARY

For many years most of the available statistical data about illness were obtained from the study of mortality. Hospitalized illness also represents an extremely important source of morbidity data. With growing interest in this field it is timely to compare hospital cases with total sickness, as such consideration may serve to avoid errors in

the interpretation of hospital statistics.

The Costs of Medical Care studies showed that about 7 per cent of all cases of reported illness and 12 per cent of cases of disabling illness were hospitalized. The proportion varied, for all illness, from 5 per cent in rural areas to 9 per cent in cities of 100,000 and over. The latest figures available from the Bureau of the Census showed that in the United States approximately 35 per cent of all deaths (1936) and 48 per cent of all births (1938) occurred in hospitals. Analysis of hospital cases is of particular value in the study of diseases for which a large proportion of all cases are hospitalized, such as appendicitis.

In general, the age distributions of total, hospital, and fatal illness are very different. In the data here presented, total sickness rates are highest under 5 years of age; hospital admission rates are highest for children 5 to 10, and adults 20 to 40 years of age; and death rates are highest in the oldest age groups.

Neither hospitalization nor death records show the primary importance of the diseases most frequently reported to be responsible for all sickness. Hospital admission rates are highest for tonsillectomies and deliveries. Heart and other degenerative diseases are leading causes of death. Colds and other affections of the respiratory tract are the most frequent causes of all sickness.

Much remains to be learned about all types of sickness. Although hospital data differ from total illness and also from mortality, they will undoubtedly provide an increasingly valuable and important source of morbidity records.

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Mortality Statistics and the Physician

An Argument for Classifying Deaths According to Informed
Medical Judgment

J. V. DEPORTE, PH.D., F.A.P.H.A.

*Director, Division of Vital Statistics, New York State Department of
Health, Albany, N. Y.*

SCIENCE, in the words of Thomas Huxley, is organized common sense. Since the common sense of yesterday is often not the common sense of today, a scientific technic based on the experience of another age may represent only the inertia of organization and sterile regard for formal consistency. Such, in the opinion of the writer, is our system of selecting the primary cause of death. The fundamental purpose of mortality statistics, aside from their purely "news" value, is to furnish public health authorities with factual information about conditions which if not controlled or prevented may lead to premature death. The basic requirements which these statistics must satisfy are: uniformity of nomenclature and assignment of each death to a single cause. The former has been achieved through the universal acceptance of the *International List of Causes of Death*. The selection of the cause of death has been and still is governed by arbitrary rules which prescribe the order of precedence in any combination of causes.

At the end of the last century national and even accurate state statistics were practically nonexistent and the formulation of a procedure for the statistical treatment of jointly reported causes of

death of necessity had as its main object the comparability of results, the "absolute correctness in the assignment of each individual cause of death" being only an incidental consideration.¹ In those days, when people in some sections of this country still died from "drinking cold water" or from "mortification," it was not only impossible to admit to learned fellowship all of the terms used in describing disease, but to accept in every instance the certifying physician's statement of the cause to which a death should be ascribed. Stress was therefore rightly placed upon completeness of medical certification and consistency in the selection of the primary cause, secured by means of arbitrary rules. In the course of time, the method, obviously a temporary expedient, assumed the cloak of permanency.

The registration practice of this country counts among its noteworthy achievements the almost complete elimination of the formerly large class of "unspecified or ill-defined causes of death," with the natural implication that the accuracy of mortality statistics is inversely related to the size of this class. The medical certificate, in effect, asks the physician: What disease was responsible for the death of your

patient? According to the latest figures the physicians of New York State know the exact answer in 99.95 per cent of all cases. Even Nazi referendums admit greater fallibility! Insistence upon definite statements when circumstances make them questionable introduces an unfortunate element of doubt in all mortality statistics, as can be readily discovered by frank converse with any practising physician. Only the other day one of my colleagues (a truthful fellow!) told me that, at the beginning of his internship in a famous hospital, several death certificates were returned to him by the local registration office because he had entered on one "starvation" as the cause of death (the comment being that no one in the city X ever dies from starvation), while the causes on the others were "unknown or ill-defined." Consultation with an older member of the staff resolved his perplexity, and whenever, during the rest of his term, he found it impossible to make a clear-cut diagnosis, he cheerfully entered bronchopneumonia as the cause of death.

As Dr. Sellers put it in his excellent paper, "Better to have ten times the number of deaths classed to 'cause unknown or ill-defined' than to have them included under headings where they very likely do not belong at all."²

Paralleling the laudable emphasis on uniform terminology, physicians have been encouraged to supply as many details as possible. As a consequence, the number of multiple certifications has been steadily increasing. For example, twenty years ago in the State of New York (exclusive of New York City) only 40 per cent of the death certificates showed two or more causes; in 1925 this proportion rose to 49 per cent; in 1934, to 69 per cent; while at present it is somewhat in excess of 75 per cent. Is this trend truly a gain? After all, certificates of death are not clinical records and details are of value only in so far

as they permit of a reasonable allocation of each death to a single cause. A study of mortality records, each representing a complex of morbid conditions, is altogether outside the scope and facilities of a state registration office, while for scientific research these records are not sufficiently informative.

Under the statistical rules which govern the treatment of joint causes, the determining consideration is usually the company in which a given cause appears and not necessarily its etiological relation to the fatal issue. Thus, when tuberculosis is mentioned in conjunction with any form of heart disease, we have a tuberculosis death, but when the companion condition is syphilis the death is designated by the latter term. As a result the recorded mortality from diseases which are given statistical preference overstates in varying degree the loss of life caused by them. The converse is, of course, true of diseases relegated to "contributory" standing. And yet, such is the force of printed numbers that even "one of the best known practitioners in the art of translating science into the common tongue," in discussing the intensification of bacterial invasion which comes with war, is led to make this naïve statement: "In 1918 . . . although the United States was on the other side of the ocean from the battlefields, its tuberculosis death rate rose by one and one-third per cent."³ One does not need a world war to raise the tuberculosis death rate by one-seventy-fifth: a minor revision in the statistical rules, so minor as not to warrant even a printed notice, can accomplish that much and a great deal more. Just because so many good people have almost religious faith in the validity of official statistics, the stress must now be placed on as close an approach to "absolute correctness" as the state of medical knowledge makes possible.

The substitution of the physician's

judgment for arbitrary statistical rules will, of course, affect the comparability of the figures. But to continue a basically unsound process merely for the sake of technical comparability would be, to put it mildly, decidedly illogical. It was this common sense attitude that led England and Wales in 1927, and Canada in 1935, to introduce a new form of medical certificate which called for the immediate cause and for "morbidity conditions, if any, giving rise to the immediate cause (stated in order proceeding backwards from immediate cause)." This innovation was accompanied by a sustained educational program in the medical schools and among the medical profession, with the result that in England the arbitrary statistical rules were to be discontinued in the present year, while in Canada "the achievement of the objective of being able to accept the certifier's viewpoint instead of selection by rule" is an imminent possibility.

The experience of these two countries influenced the adoption of similar phraseology in the 1939 revision of the standard death certificate used in the United States. Here the physician is not only asked to state the immediate cause of death, antecedent causes in reverse order, and "other conditions," but to underline that cause to which he believes the death should be charged statistically. The new form has been in use in the State of New York, exclusive of New York City, since January, 1940, and it now seems both pertinent and timely to ascertain to what extent it has elicited the desired information, and to measure the effect upon the mortality statistics of the differences between the opinions of the certifying physicians and the statistical rules. For this purpose we have examined all of the certificates for the month of January, 1940, and a sample of 500 certificates for January, 1941.

The certificates filed in January,

1940, totalled 6,849; their distribution, according to the number of causes and the physician's indicated choice, is as follows:

All certificates	6,849
Certificates showing one cause	1,630
Certificates showing two or more causes	5,219
No choice indicated by physician ...	<u>3,193</u>
Choice indicated by physician	<u>2,026</u>
Choice in agreement with statistical rules	<u>1,149</u>
Choice in disagreement with statistical rules	<u>877</u>

The physicians indicated their choice on less than 40 per cent of the certificates having two or more causes; on the other hand, in a considerable proportion of certificates having only one cause, and therefore permitting of no choice, the single cause was underlined. An examination of the certificates filed a year later, the results of which will be presented in detail in another section of this paper, has strengthened the impression conveyed by the figures in the preceding table that underlining is an unsatisfactory means for registering the judgment of the certifying physician. Here one should be guided by the logical order of medical certification and not depend on a mechanical stroke of a pen or typewriter, which may inadvertently be omitted or put in the wrong place.

Of the 2,026 cases in which a choice of cause was indicated, there was agreement with the statistical rules in 1,149 and disagreement in 877 cases. It is the latter group that is of immediate interest. In a minority of this group the disagreement was apparently due to the physician's lack of familiarity with the rudiments of certification, namely, that whenever possible a death should be assigned to the cause which was first in order. Typical is the combination of whooping cough and pneumonia, with the latter indicated as the cause of death. A great majority of the cases represented, however, basic disagree-

ment between medical judgment and the prevailing practice. And, by the way, the picture was strikingly the same among deaths which occurred in hospitals and deaths which occurred in private dwellings.

Since in most of the multiple certifications the physicians failed to indicate their preference, it is impossible to tabulate all of the deaths for the month according to the statistical rules and the judgment of the certifying physicians. There would be little value in an arbitrary distribution of the certificates on which no choice was indicated. The comparison will, therefore, be made only for those certificates on which a choice could be and was specified.

If the tabulation were based on the physician's indicated choice there would have been a decrease in the recorded mortality from tuberculosis, syphilis, cancer, diabetes, diseases of the heart (except coronary arteries and angina pectoris), ulcer of the stomach or duodenum, and nephritis; and an increase in the other causes listed in the table. It is interesting to add that there would be essentially no difference (only 1 per cent) in the combined mortality from intracranial lesions, diseases

of the heart and arteries, and chronic nephritis, the shifts occurring within the confines of this large class. The disagreement in the assignment to some of the other causes is decidedly instructive and deserves detailed presentation.

Tuberculosis, all forms—The number of deaths ascribed by the statistical rules to tuberculosis, all forms, was 239: in 119 certificates tuberculosis was the only cause given, in 120 it was one of two or more causes. The physicians indicated their preference in 57 of these, agreeing with the statistical assignment in 44 cases. In the remaining 13 the physicians chose the following:

Diseases of the heart	6
Diseases of the arteries	2
Diabetes	2
Leukemia	1
Ulcer of the stomach	1
An "ill-defined" cause	1

On the other hand, 2 deaths which the statistical rules assigned to syphilis were ascribed by the physicians to tuberculosis.

Cancer, all forms—The number of deaths ascribed by the statistical rules to cancer, all forms, was 717: in 223 certificates cancer was the only cause,

TABLE 1

Tabulation of Causes of Death According to Statistical Rules and Opinion of Certifying Physicians

	<i>Statistical Rules</i>	<i>Opinion of Physicians</i>
Tuberculosis, all forms	57	46
Syphilis	30	13
Cancer, all forms	189	159
Diabetes	75	20
Intracranial lesions of vascular origin	230	294
Diseases of the heart	790	715
Chronic myocarditis	489	315
Diseases of the coronary arteries and angina pectoris	128	220
Diseases of the arteries	45	188
Arteriosclerosis	44	179
Pneumonia, all forms	110	161
Ulcer of the stomach or duodenum	14	9
Hemorrhagic infarction, thrombosis, edema, and chronic congestion of the lungs	1	53
Nephritis, chronic and unspecified	208	87
Senility	0	8

in 494 it was one of two or more causes. The physicians indicated their preference in 189, agreeing with the statistical assignment in 158 cases. In the remaining 31, the physicians chose the following:

Pulmonary tuberculosis	1
Intracranial lesions of vascular origin..	2
Diseases of the heart	10
Arteriosclerosis	3
Nephritis, unspecified	3
An "ill-defined" cause	3
Other causes	9

In no case did a physician assign a death to cancer when the statistical rules called for an assignment to a different condition.

Diabetes—The number of deaths ascribed to diabetes by the statistical rules was 211: in 19 certificates, diabetes was the sole cause; in 192 it was one of two or more causes. The physicians expressed their preference in 75 certificates, agreeing with the statistical rules in only 18 cases. The rest were ascribed by the physicians to the following:

Diseases of the heart	26
Pneumonia, all forms	8
Cerebral hemorrhage	7
Arteriosclerosis	4
Nephritis, chronic and unspecified.....	6
Pulmonary edema or embolism	3
An "ill-defined" cause	2
A disease of the ear	1

There were only two additions to the diabetes deaths which the statistical rules ascribed to pulmonary tuberculosis. Therefore, if the physician's judgment were followed, deaths from diabetes would have numbered only 20 as compared with the official total of 75.

Pneumonia, all forms—The number of deaths ascribed by the statistical rules to pneumonia, all forms, was 354: in 105 certificates, pneumonia was the sole cause given; in 249 it was one of two or more causes. The physicians expressed their preference by underlining the cause on 110 of the certi-

cates: in 80 cases they agreed with the statistical assignment, in 30 they chose the following:

Arteriosclerosis	9
Diseases of the heart	5
Abscess of the lung	2
Acute nephritis	2
Other causes	12

On the other hand, the physicians assigned to pneumonia 81 deaths which the rules of statistical practice classified as follows:

Diseases of the heart	28
Diabetes	8
General paralysis of the insane	5
Arteriosclerotic kidney	4
Accidental fall	5
Influenza with respiratory conditions..	5
Other causes	26

Thus, if the tabulation of the deaths were based on the judgment of the physicians, the group of 110 pneumonia deaths would have been increased to 161.

Senility—The physicians ascribed 8 deaths to senility which were assigned by the statistical rules as follows: 2 to chronic myocarditis, and 1 each to non-malignant tumors of female genital organs; myocarditis, unspecified; arteriosclerosis; bronchopneumonia; a skin disease; and accidental fall.

In order to measure the effect of a year's experience, the certificates for January, 1941, were examined and it was then discovered that the number of cases in which the preferred cause was underlined had decreased to such an extent as to make a comparison on this basis impracticable. It was decided, therefore, to study the sequence in which the causes were entered on a sample of 500 certificates and to assume that the last condition set down by the physician represented his choice of cause to which the death should be assigned.

The broad results of this examination follow:

Total number of certificates	500
Certificates with one cause	130
Certificates with two or more causes ..	370
Physician's choice in agreement with statistical rules	199
Physician's choice in disagreement with statistical rules	171

In the last group the entries made by the certifying physicians appeared in logical order in 105 cases, while the assignment according to the statistical rules was as follows:

Immediate cause	64
Cause, other than last	11
"Other conditions"	26
Condition for which operation was performed	4

In 66 certificates the statements were without any logical order. Here are two examples: bronchopneumonia due to influenza, due to partial coronary occlusion; and coronary thrombosis, due to hypertension, due to arteriosclerosis, due to diabetes.

SUMMARY

A study of the nearly seven thousand death certificates filed in New York State (exclusive of New York City) in January, 1940, and of a sample of 500 certificates filed in January, 1941, indicates that:

1. It is impracticable to secure an expression of the physician's judgment as to the cause of death by means of underlining.

2. There is considerable divergence between the statistical treatment of joint causes and medical opinion as expressed by underlining, or implied in a logical arrangement of the causes of death. This divergence is particularly striking for deaths assigned to pneumonia and diabetes.

3. The findings are in general agreement with those obtained in England and Wales and in Canada, where the

phrasing of the medical certification is similar to that on the standard form used in this country.

4. In a considerable proportion of cases the certifying physicians apparently chose an intermediary or terminal condition as the cause of death, or listed the causes in altogether illogical sequence.

CONCLUSIONS

The writer is in full agreement with the procedure initiated some fifteen years ago in England and Wales and introduced several years ago in Canada, which has as its ultimate object the substitution of the judgment of the certifying physician for arbitrary statistical rules. The experience of these countries has shown that such a substitution can be made only when every practising physician fully understands what facts he is expected to furnish to the statistical office and in what order they must be presented so that the classification of a death may truly represent his deliberate judgment. At present the physician is inclined to give little thought to a multiple certification because he knows that arbitrary rules and not his professional opinion will determine the allocation as to cause.

As a first step toward more accurate official mortality statistics, provision should be made in all medical schools for the instruction of students in concise, adequate, and orderly statement of causes of death; and departments of health, in coöperation with medical organizations, should impress the basic principles of medical certification upon the physicians already in practice.

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Nursing Care of the Sick as a Part of Complete Nursing Service in Rural Areas*

HELENE B. BUKER, R.N.

Assistant Director, Bureau of Public Health Nursing, State Department of Health, Lansing, Mich.

IN any large city of our country and in many of the small cities some kind of skilled nursing care is available in home or hospital to every person sick enough to need it. In rural communities the situation is very different. Hospitals may be so far away that bad weather and road conditions make hospitalization impossible or inadvisable except in cases of extreme emergency. Private duty nurses frequently cannot be secured and rural public health nurses who do bedside nursing are comparatively few.

As a rural public health nurse often serves from 10,000 to 20,000 people scattered over a wide area, it seems unlikely that bedside nursing on an extensive scale can be undertaken until more nurses are provided, but even now bedside care for teaching and demonstrative purposes could be effectively employed to a much greater extent.

In her recent book, *The Public Health Nurse and Her Patient*,¹ Ruth Gilbert makes the following statement about bedside nursing:

No one is thinking of bedside nursing now in the terms in which he thought of it some years ago: it is now bedside nursing plus. It has rolled up like a snowball until it includes everything the nurse knows and all her skill. Therefore, bedside nursing no longer need be rejected by those who are interested in teaching and in prevention of sickness on the ground that it is a mere picking up of the pieces. People still become ill in spite of the efforts of public health to combat this state of affairs. Faced with this reality situation, many public health nurses are reemphasizing that it is their job to nurse the sick with added skill and understanding as well as to seek to prevent illness. . . . Bedside nursing gives the public health nurse, with her interest in preventing disease and in fostering health, a welcome in the patient's home because the patient and the family need her help.

In an effort to find out something about bedside service being given in rural areas, the speaker secured from the National Organization for Public Health Nursing a list of rural health agencies that had indicated in a review study made in 1938 that they were doing some bedside nursing, and wrote to these agencies for further information. The response was excellent. From a total of 25 letters sent out, 22 replies were received. These came from 16 different states. In practically all the agencies, the public health nursing service is part of the program of a

* Read at a Joint Session of the Michigan State Organization for Public Health Nursing and the Public Health Nursing Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

county or district health unit. Four of the agencies state that they do no bedside service. The following are some of the results shown from a study of the other 18.

Twelve of the 18 agencies are supported entirely by official funds, while 6 receive support from some private as well as official funds. The ratio of nurses to population varies from one nurse to 2,300 people and one nurse to 2,500 people in two of the agencies partially supported by private funds, to one nurse to 16,000 people in three of the county services. The average ratio for the 16 agencies for which this information is recorded is one nurse to nearly 9,400 people.

Only one of the agencies is giving bedside care as needed for all types of cases, including delivery service. In this one there has been an affiliation of a health district and a visiting nurse association. A second agency is giving all types of bedside care except home delivery service. These two agencies are both partially supported by private funds. They are the agencies with one nurse to 2,300 and 2,500 population respectively. Bedside visits comprise 27 per cent of the total visits of the first, and 21 per cent of the total visits of the second. Both agencies have a fee for bedside nursing service.

With the exception of these two agencies, all limit their bedside nursing service entirely or for the most part to demonstrations for teaching purposes and to emergencies. Conditions mentioned for which bedside care or demonstrations are given include cases of communicable disease, including tuberculosis and pneumonia, maternal and infant care, dressings, and cancer. Several agencies state that care is given mostly to indigent and low income groups, but the majority do not make this stipulation. Seven of the agencies make some provision for answering emergency calls on Sundays and holidays. None of the

agencies, supported entirely by official funds, have a routine fee for bedside service, though in one agency collection of a fee is permissible. The proportion of bedside visits as reported by eight agencies ranges from 1 to 21 per cent of the total visits. The average for all eight agencies is 11 per cent. All the agencies for which the percentage of visits is not recorded give bedside service for demonstration and emergency purposes only, and some state that this service is very limited, so it is assumed that the proportion of bedside visits for this group is much lower than for the group for which it is recorded.

The agencies were asked if other community resources for bedside nursing were utilized, but there were only 6 replies to this question. Resources mentioned were graduate and practical nurses, nursing service of the Metropolitan and John Hancock Life Insurance Companies, home hygiene students, and housekeeping aids.

The study indicates that bedside care, even for demonstration purposes, is the exception rather than the rule for most rural areas of the country. However, there have been some encouraging developments during the last few years.

In New York, where the State Department of Health is advocating bedside nursing service by all nurses, at least on a demonstration basis, reports from field nurses throughout the counties of the state indicate that there is a steady increase in the per cent of bedside nursing visits. An analysis of nursing visits for eight districts of the state was made in 1939. The reports included counties where only one public health nurse was employed, as well as those employing as many as 5. It was found that in a total of nearly 80,000 visits, bedside care was given in almost 9,000 visits, or 11 per cent. This represented an average of 13 bedside visits for each month of nursing service rendered in the 8 districts.

Aided by social security funds a number of states have set up maternity demonstrations in one or more counties or districts. These demonstrations include home delivery nursing service and some bedside care for postpartum and new-born patients. To be sure, this service is available to only a very small proportion of the 86 out of every 100 farm women who are delivered at home,² but it is a small step in the right direction.

The affiliation of private and official agencies for the provision of a generalized nursing service including bedside care is meeting rural nursing needs in a few places, especially in suburban counties or in other fairly thickly populated counties where some provision for bedside service had been made for parts or all of the area by private organizations. However, in the majority of rural counties there are no private public health nursing agencies with which the official agency can affiliate.

In one county a volunteer agency budgeted funds to add personnel to the staff of the official agency so that a program of bedside care could be developed. To date, however, the official agency has not been able to arrange for the program, and the funds of the volunteer group are lying idle.

Public health nurses in the rural areas are feeling the need for bedside care and they are showing more appreciation of the value of teaching through demonstration. Teaching by demonstration takes time, but nurses are realizing that even though the total visit count may be smaller, the end results may be far greater. A number of nurses who sent information about their programs made comments on the need and desirability of bedside care and demonstration.

One supervising nurse for a county in a southern state wrote:

We try to stress bedside care for purposes of demonstration and in emergencies. Though many times we see the case but once during

an acute illness, much good can be accomplished by one thorough demonstration as to what good bedside care really means. It is obviously impossible for a staff of 6 nurses to do a bedside nursing care program for a population of 60,000, but we try to do as much as we can for the following reasons:

It helps to sell the service to the community. . . . It is the bedside care that unloosens the purse strings of the city and county finance committees.

Our work is primarily with people of few educational advantages and, with this group, teaching by demonstration is more effective than the spoken or printed word.

Also, with this same group, there is much more respect for the nurse who has demonstrated that she can work with her hands and that she can do things as well as talk.

The need is apparent. How the problem is to be met, how sufficient nurses are to be provided to give even a minimum of bedside service in rural areas, is a question; but if the people of a community realize the value of such a service and want it sufficiently, some way may be found to meet the need, whether with public or private funds.

At the A.P.H.A. convention last year Dr. Godfrey, Health Commissioner of New York State, in his paper,³ "Dynamic Relationships," said:

There are still some differences of opinion regarding the method of providing a visiting bedside nursing service for all the people in every hamlet of the state. There seems to be an acceptance by the public that they need the service. If they endorse it to the extent of providing funds for that purpose, then the service becomes a proper one to the public agency.

Dr. Parran, Surgeon General of the U. S. Public Health Service, also endorses the use of public funds for bedside nursing in rural areas. Three years ago this month, speaking at the Silver Jubilee Dinner of the National Organization for Public Health Nursing, he said⁴:

It seems to me that a next and needed step is for health departments to provide community nurses who will have responsibility both for prevention and for bedside care as

needed. I say health departments because the present visiting nurse organizations are for the great part confined to cities. In rural areas I see no way by which these needed services can be given except through public funds.

Some cities have been making studies of all their nursing resources with the purpose of coördinating existing facilities and rendering better and more adequate service to the public. A few cities have organized community nursing councils. Would it not be advantageous for lay and professional groups in rural communities to get together to study their nursing needs and resources? They

might then develop plans for making the best possible use of all existing resources and for adding to these as may be necessary to the end that at least a minimum of skilled nursing care shall be available in time of need to every person in the community.

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MEMBERSHIP ROLL CALL—NOVEMBER 11-30, 1941

Appraisal of Nutritional Status

INTRODUCTORY REMARKS

FRANK G. BOUDREAU, M.D.

*Executive Director, Milbank Memorial Fund,
New York, N. Y.*

DURING the last forty years attempts have been made to appraise nutritional status by either or both of two methods: clinical examination and physical measurement. The results obtained have been difficult of interpretation or actually untrustworthy or misleading so that the methods have come to be regarded as lacking in precision. As no satisfactory alternative methods were then available, these old methods were retained for a time, but they have become more and more discredited.

In the meantime, studies on the nutritional state of the body have shown that the earliest stage of deficiency diseases is represented by the latent or subclinical stage, and convincing evidence has been adduced that much of the unsatisfactory nutrition in the population is in the latent form.

Owing to the acknowledged shortcomings of the older methods of appraisal (clinical examination and physical measurement), we are not yet in a position to describe the exact size, nature, and distribution of the problem of nutrition in this country. Until it is thus defined, neither therapy nor education can be applied most effectively. But it is clear that the old methods, which have proved to be so misleading and unsatisfactory, hold no promise of usefulness for this purpose.

In recent years, numerous chemical

and physiological tests have been developed which have demonstrated their value in the detection of the latent state of the several deficiency diseases. A large number of these methods are being put to the test in four independent investigations. The use of such a large number of tests may seem exaggerated, but it must be remembered that only by the simultaneous application of these various tests on the same individuals can there be a basis for judgment in selecting the significant and necessary minimum. Their use in public health work must be conditioned by the following practical questions:

To what extent can the detection of cases of malnutrition be simplified?

How few tests will give a reliable indication of nutritional status?

Nevertheless, it is becoming more and more apparent that the appraisal of nutrition is not to be accomplished by one or two simple tests.

There are four projects under way in this country, in which attempts are being made to appraise nutritional status by some or all of these newer methods. Of these four projects we have reports herewith from three.

Last year a study was begun among a rural group in Tennessee. It is being conducted by the School of Medicine, Vanderbilt University, under the auspices of The Rockefeller Foundation. Dr. John B. Youmans, of this project,

will present a paper on "An Assessment of the Nutrition of a Rural Population in Tennessee."

In 1935, as part of a long-time program of human nutrition research, the Division of Home Economics Research of The Pennsylvania State College instituted an investigation of the nutritional status of children of preschool age in relation to various dietary practices.

As the number of tests was gradually increased and a mobile unit was organized, examinations were conducted in widely separated and different kinds of Pennsylvania communities, both rural and urban. Dr. Pauline

Beery Mack, of this project, will speak on "Mass Studies on Human Nutrition in Pennsylvania."

In 1938, the Division of Child Hygiene of the U. S. Public Health Service, the Departments of Preventive Medicine and Pediatrics of the Cornell University Medical College, the New York City Department of Health, and the Milbank Memorial Fund joined in a comprehensive study on a coöperative basis. A series of twenty tests were applied to approximately 2,500 students of the Seward Park High School on the Lower East Side of New York City. The next four papers to be presented are from this project.

Dark Adaptation Characteristics of Private School Children Measured with the Adaptometer^{*†}

CARROLL E. PALMER, M.D., F.A.P.H.A.

*Passed Assistant Surgeon, U. S. Public Health Service,
Washington, D. C.*

AN "elevated" visual threshold during dark adaptation, or an apparent inability to perceive dim light, has frequently been interpreted as a sign of vitamin A deficiency. In this connection, the term "elevated" threshold should be limited in its application to a condition which cannot be explained by such primary pathologies as opacity of the cornea, lesions of the retina, or other ocular disease, or by congenital factors. The problem, therefore, of defining "elevated" threshold as a part of the complex or residual of other eye conditions becomes complicated by a number of difficulties among which is establishing "a standard of normality" of thresholds. By testing many persons who are healthy in all obvious respects, one may arrive at

a determination of the range of usual variation of visual threshold. Furthermore, in the course of such testing there will be found certain individuals whose visual thresholds seem unusually high in relation to those of their supposedly comparable associates. Such individuals may be designated as having "elevated" thresholds within the meaning of the term as used here and such individuals are, therefore, at least suspect as nutritional deficiency cases.

This method of defining "elevated" threshold is especially useful in school and community surveys in which the majority of subjects are tested only once.

The present report describes the dark adaptation of 175 apparently healthy high school children. The test results for this group are of interest as a reference relative to which other individual or group performance can be appraised.

MATERIALS AND METHODS

The sample—The children examined, ranging in age from 12 to 19 years, came largely from Jewish families of relatively high-income level and were all in attendance at a private day school in a suburban locality near New York City. However, the sample may not

* From a cooperative investigation by the U. S. Public Health Service, Division of Public Health Methods; the Cornell University Medical College, Department of Public Health and Preventive Medicine and Department of Pediatrics; the Milbank Memorial Fund; and the New York City Department of Health.

The cooperating agencies have been assisted in carrying out this investigation by the Work Projects Administration for the City of New York, Official Project No. 65-1-97-21, W. P. 24, "Medical Evaluation of Nutritional Status."

† Based upon a report read before the Food and Nutrition Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

represent a well nourished group in the strict sense, since there were in it individuals whose nutritional status was no doubt less than optimal, as related either to vitamin A or other nutritive elements. Preliminary analysis of the diet histories of 136 children from the same population indicated that the diets of approximately 40 per cent of the group provided less than 5,000 international units of vitamin A per day.¹ Roughly, 18 per cent of the same group were receiving smaller daily allowances of vitamin C and calcium than are commonly recommended. However, their diets appeared to be more satisfactory with respect to adequacy of vitamin B₁, riboflavin, protein, and, probably, iron.

No gross opacities or other abnormalities interfering with the transmission of light to the retina were reported in the medical examinations by the physician. Errors of refraction were not measured and have not been corrected for the purpose of the dark adaptation test.

Apparatus and test procedures—The adaptometer which has been described in detail by Hecht and Shlaer,² is a device with which the operator exposes one of a subject's eyes to a light of standardized brightness (preadaptation) and measures the dark adaptation of that eye by determining, at specified intervals of time, the threshold of perception of light stimuli of known intensity. In the course of the present study it was found on preliminary use of three adaptometers bought in the commercial market that results were not mutually comparable and that considerable recalibration of several units of the instrument would be necessary. Accordingly, the Corning 511 violet filters, the glass wedges and "neutral" filters were checked by the U. S. Bureau of Standards. To obviate difficulties of calibration of the light source, the Macbeth illuminometer was used. The

study of the instruments was reported in an earlier paper.³

It might be mentioned in passing that, as a result of the review of the instruments it became apparent that uniformity of preadaptation brightness was quite essential if comparisons are to be made of thresholds determined before 20 minutes in the dark. In the present study preadaptation brightness was equalized through adjustment of operating current by means of a manually controlled rheostat and voltage regulator assembly.

Each subject in the study was preadapted to approximately 1,060 millilamberts (12.024 log units) for 3 minutes, after which dark adaptation observations were made at 2 to 3 minute intervals during 30 to 35 minutes. Light adapting and test fields, 35° and 3° respectively in diameter, were viewed 7 degrees nasally, using the right eye. The test light was exposed in flashes lasting 0.2 second. During threshold determinations the Corning 511 violet filter, transmitting wave lengths below 460 millimicrons, was used. The tests were made by four technicians using the same instrument. The method of determining the threshold has been fully described elsewhere.³ The brightness of the threshold is expressed in the logarithm of micromicrolamberts ($\mu\mu l$).

THRESHOLD DISTRIBUTIONS

Visual thresholds after 20 minutes' dark adaptation are discussed in the present report because these later thresholds are apparently more responsive than the earlier ones to a withdrawal of vitamin A from the diet^{4, 5, 6} and their determination is less subject to observational error.³ In this description the threshold values for all cases were grouped together according to dark time and for each minute in the adaptation interval, 20–35 minutes inclusive, were arranged in a

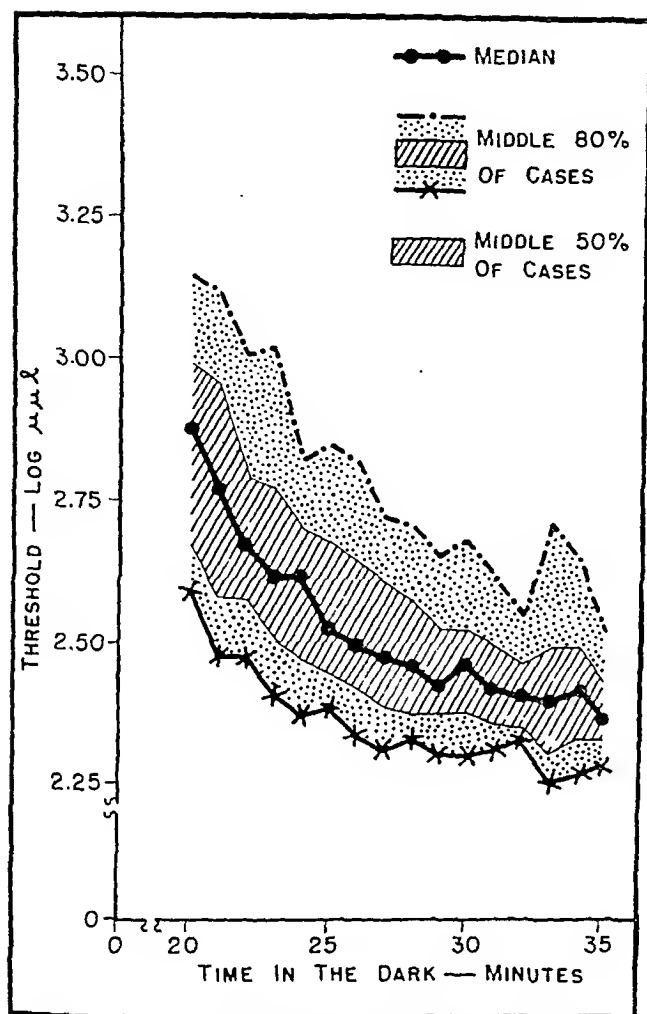


FIGURE 1—Threshold at Specified Percentiles of the Distributions for Private High School Boys and Girls, 12–19 Years of Age, After 19 Minutes Dark Adaptation Following 3 Minutes Preadaptation to 1060 Millilamberts

frequency distribution. Since the observations were made at about 3 minute intervals, each distribution contains roughly a third of the cases. The cumulative frequency percentage curve was plotted for each distribution. From each such curve five percentiles (10th, 25th, 50th, 75th, 90th), were obtained by interpolation. The values of the percentiles of the threshold distributions are given in Table 1 and illustrated in Figure 1.

Median threshold at 20 minutes is 2.89 log units; at 30 minutes, 2.47 log

units. The regression of the median as well as of the other percentiles shows fluctuation, due in part to the case composition of the successive distributions. After 30 minutes the median is fairly constant and indicates a threshold level at which adaptation is nearly complete.

In Figure 1 the middle 50 per cent of cases, represented by the area between the 25th and 75th percentiles are fairly symmetrically distributed about the median. The variability of this central group shows a tendency to decrease after 20 minutes and is relatively low in the period 30–35 minutes. At that period the average difference in threshold level between the limits of the middle 50 per cent of cases is only 0.15 log units, whereas at 20 minutes the difference is about twice as great, 0.32 log units.

Above the 75th percentile the threshold distributions are noticeably skewed.

Thresholds for boys did not differ significantly from those for girls, nor was there any significant difference in threshold as between age groupings.

COMMENT

The reference distributions of threshold outlined in Table 1 indicate the performance to be expected of the middle 80 per cent of children who are: (a) In the given age range, (b) from a relatively high socio-economic level, and (c) examined according to the

TABLE 1

Threshold Values, at Specified Percentiles, of the Distributions for Private High School Boys and Girls, 12-19 Years of Age, After 3 Minutes' Preadaptation to 1060 Millilamberts, According to Time in the Dark

Time in the dark Minutes	Cases Number	Threshold values at specified percentiles				
		90th log μl	75th log μl	50th log μl	25th log μl	10th log μl
20.0	54	3.16	3.00	2.89	2.68	2.60
21.0	48	3.14	2.97	2.78	2.59	2.48
22.0	51	3.02	2.80	2.69	2.58	2.48
23.0	56	3.03	2.79	2.63	2.51	2.41
24.0	56	2.83	2.71	2.62	2.47	2.37
25.0	57	2.86	2.69	2.53	2.45	2.39
26.0	58	2.83	2.65	2.50	2.42	2.33
27.0	55	2.73	2.61	2.48	2.39	2.31
28.0	50	2.71	2.58	2.47	2.38	2.33
29.0	59	2.66	2.53	2.43	2.37	2.30
30.0	56	2.69	2.53	2.47	2.38	2.30
31.0	48	2.60	2.50	2.42	2.36	2.31
32.0	51	2.55	2.47	2.41	2.35	2.33
33.0	50	2.72	2.50	2.40	2.30	2.25
34.0	58	2.66	2.50	2.42	2.33	2.26
35.0	50	2.53	2.43	2.37	2.33	2.28

specifications of the study. Using percentiles of the distributions offers a convenient and flexible method of defining performance. The limits of the middle 50 per cent of cases may be chosen as characterizing "usual performance," or other ranges may be selected depending on the particular problem under consideration.

If usual performance is defined as that of the middle 50 per cent of cases, the threshold at 20 minutes ranges between 3.00 and 2.68 log units; at 30 minutes, between 2.53 and 2.38 log units. Judged according to this central group, threshold values above 3.00 log units at 20 minutes and 2.53 log units at 30 minutes are high enough to warrant further study and examination of the children concerned, by means of other diagnostic procedures. Whether the threshold is actually abnormally high can be determined subsequently by repeated adaptation tests, other ophthalmological findings, and response to therapy.

In the latter connection, it should be mentioned that the evidence is not conclusive that "elevation" of threshold will respond only to vitamin A therapy.

For example, Stewart⁷ claims to have obtained equally good results with vitamin C, and Frandsen⁸ has reported improvement of visual sensitivity during adaptation after administration of vitamin D and calcium phosphate. McFarland's⁹ studies of anoxia and hypoglycemia suggest a relation between visual threshold as measured by dark adaptation and the efficiency of the oxidative process in the central nervous system. The reports mentioned indicate the possibility that a lack or failure in utilization of more than one nutritive factor may contribute to an "elevation" of threshold.

Although at the present time an unusually high visual threshold cannot be interpreted definitively as a sign of avitaminosis A, dark adaptation examinations can be useful for screening out individuals whose status is suspect because of poor performance.

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Medical Evaluation of Nutritional Status*

Roentgen Appraisal of Development†

WILLIAM M. SCHMIDT, M.D.

*Departments of Pediatrics and Public Health, Cornell University Medical College,
New York, N. Y.*

THE present report is based upon assessments of roentgenograms of three skeletal areas—hand, elbow, and hip—of 180 boys in a private high school and 292 boys in a public high school. These boys form a part of the total group of approximately 3,000 adolescent boys and girls. The purpose, methods, and subjects of the study have been described in a previous report from the coöperative investigation. Further studies of the roentgenograms of the entire group, and of the technic of assessment are in progress.

Nutritional requirements during childhood differ at different ages, and this age variation is always taken into account in estimating requirements or in defining criteria for the interpretation of nutritional tests and measurements. Growth, as measured by

changes in body size and weight, is one important aspect of age variation, and the reciprocal relation between growth and nutrition is well recognized. During the period of growth, marked impairments of nutrition will diminish, or even abolish for a period, increments of stature and breadth as well as of weight. Conversely, the rate of growth itself is a determinant of the nutritional requirements of the individual child and a factor influencing the manifestations of nutritional deficiency diseases.

Differentiation of tissues and organs is another aspect of change occurring with age. Such change is termed developmental, and while related to growth in size, it requires separate consideration. Especially in the adolescent period, the age span of subjects of the present study, considerable variation in development exists at each chronological age. This variation is apparent even on simple inspection and classification of external features of development. Variation in development may well be related to nutritional requirements and to the individual levels manifested in response to specific nutritional measurements, such as hematological and some chemical determinations. If such a relationship exists, classification of subjects by age alone, or perhaps

* From a coöperative investigation by the U. S. Public Health Service, Division of Public Health Methods; the Cornell University Medical College, Department of Public Health and Preventive Medicine and Department of Pediatrics; the Milbank Memorial Fund; and the New York City Department of Health.

The coöperating agencies have been assisted in carrying out this investigation by the Work Projects Administration for the City of New York, Official Project No. 65-1-97-21 W.P. 24, "Medical Evaluation of Nutritional Status."

† Based upon a report read before the Food and Nutrition Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

even by age and body measurements, may fail to reveal possible trends in nutritional measurements which could be identified with classification of subjects according to an estimate of developmental status.

The rating of development on the basis of external anatomical features made by the examining physicians in this study appeared to permit only a broad classification of subjects. In an effort to secure a more precise rating of development, therefore, roentgen studies of skeletal maturation were made.

In the adolescent age period, clearly marked qualitative changes are present in the ends of the shafts of the bones and in their related epiphyses up to the point of complete skeletal maturity. In order to describe the developmental status and developmental progress of a group of children, it is necessary that these stages of skeletal change be placed in a series, of which each film represents a successive step in skeletal

maturation. A number of such series have been described, among them those of Rotch (1907), Hellman (1928), Shelton (1931), Flory (1936), and Todd (1937). Todd's *Atlas of Skeletal Maturation*. I. *Hand*, comprises 35 films of female hands and 40 films of the male series. Standards were also prepared by Todd and his associates for the shoulder, elbow, hip, knee, and foot, but have not been published.

Some investigators have chosen to rely upon the appraisal of a single skeletal area as a measurement of development. However, progress in different regions of the skeleton may not be uniform. In the present investigation, roentgenograms of each of three areas—hand, elbow, and hip—were secured from each subject to permit a study of skeletal maturity in several areas of the skeleton. They were assessed against the standards of Todd and his coworkers. Each of the standards is described as representing the median film from a series of children

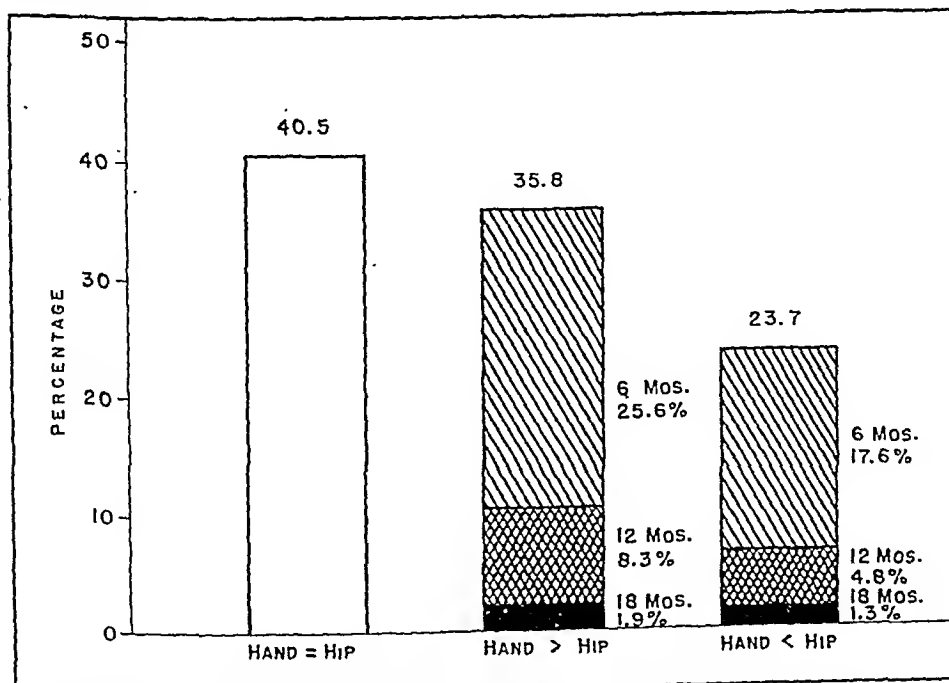


FIGURE 1—The Relation between Skeletal Age of Boys Based upon the Hand Assessment and Skeletal Age Based upon the Hip Assessment

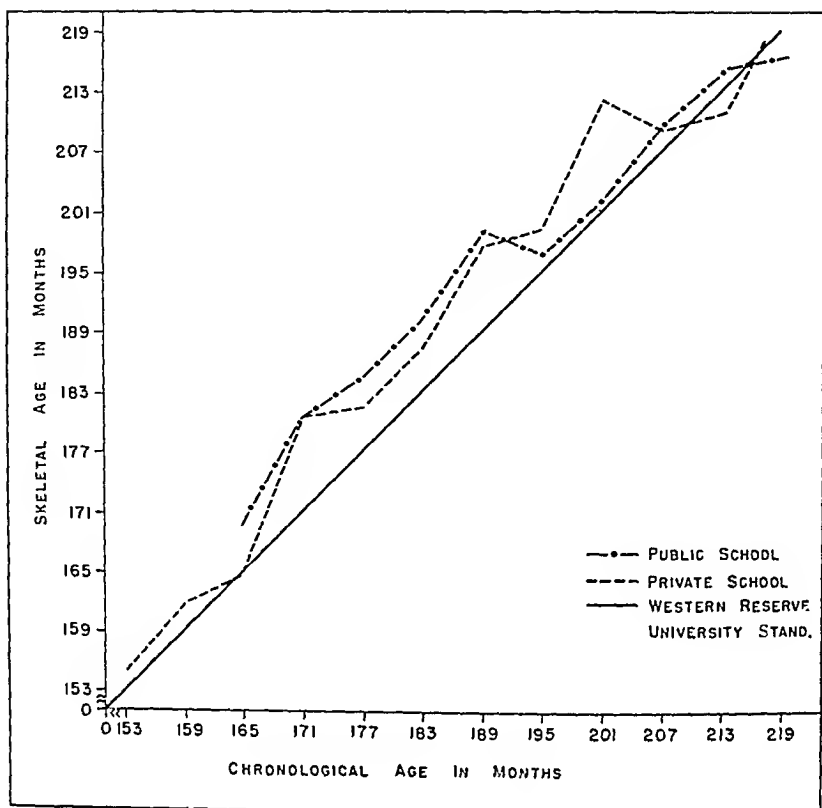


FIGURE 2—The Median Skeletal Ages by Chronological Age Classes of Boys from a Private and a Public School

whose chronological ages fall within a 6 month age span. Each film in the series is numbered and is referred to an age equivalent which is the mid-point of the 6 month chronological age span of the children from whose roentgenograms the standard was chosen. With perhaps some reservation, therefore, it may be said that the standards represent the median skeletal "age" for each chronological age group, of presumably healthy, well developed children of Cleveland.

The assessments of skeletal development by each of the three areas studied were compared with each other. Figure 1 illustrates the relation of skeletal age according to the hand assessment as against that based upon the hip assessment. It will be seen that the two ratings so obtained correspond

within a 6 month span in approximately 40 per cent of the cases, but that differences of 6 and 12 months occur in 43 per cent and 13 per cent respectively, and in a small proportion of cases even greater differences are present. The same is true when the relationships between hand and elbow and between elbow and hip are examined. The importance of these differences is a subject for further detailed investigation, and it is sufficient at this time merely to mention them. In the subsequent figures, the skeletal age will refer to the mean derived from the age equivalent in months of the three areas.

The median skeletal ages of each 6 months chronological age group of the boys from the private and public schools are presented in Figure 2, in

which the age equivalents of the Western Reserve University standards are indicated by the continuous line. The number of cases at each year of chronological age is shown in Table 1. The

TABLE 1
Number of Cases in Each Year of Chronological Age

<i>Age Years and Months</i>	<i>Public School</i>	<i>Private School</i>
Less than 13	4	28
13-13-11	13	36
14-14-11	31	31
15-15-11	74	30
16-16-11	84	28
17-17-11	59	19
18 and over	27	8

medians of the public and private school groups approximate each other fairly closely. When compared with the age equivalents of the Western Reserve standards, the New York children appear to represent a somewhat greater

degree of skeletal advancement for most chronological ages, although the differences are not great.

There is a considerable degree of variability of skeletal ages in each chronological age group for both the private and public school pupils. The range of skeletal age, for most chronological ages spreads over a span of 4 years. Figure 3 presents the percentage of children in each school with skeletal age corresponding to chronological age within a 6 month span, and the percentage of those with differences greater than 6 months. Those with differences are divided into two groups, one in which the skeletal age is greater than the chronological, and another in which the skeletal age is smaller than the chronological. Differences of 1, 2, and more than 2 years are indicated. It will be seen that approximately one-

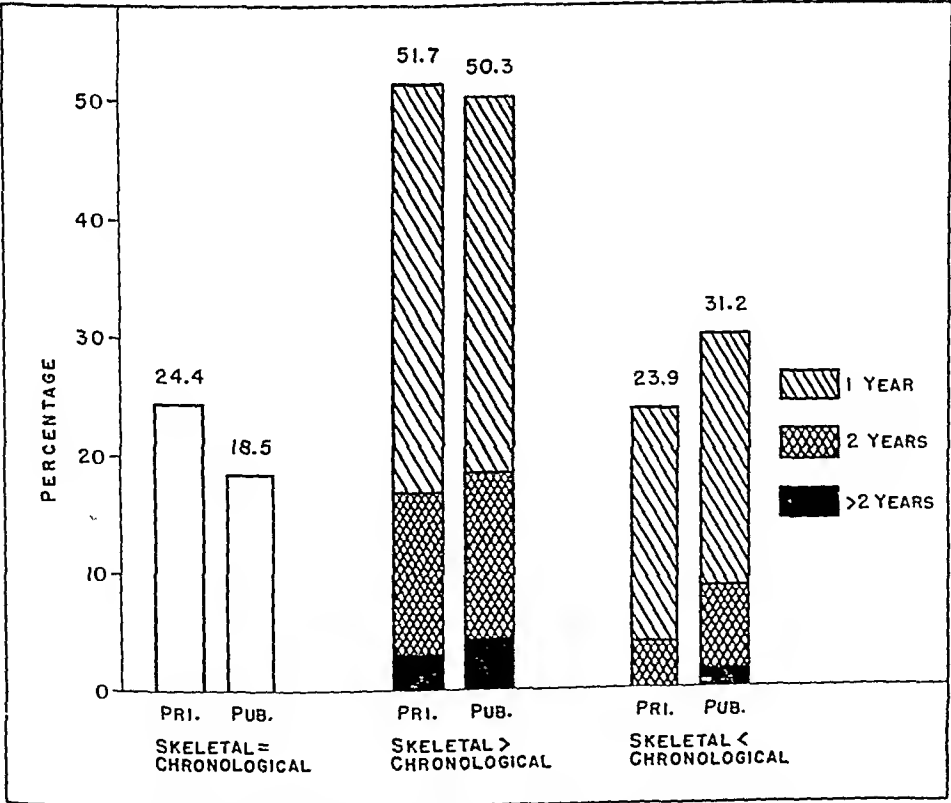


FIGURE 3—The Relation of Skeletal and Chronological Age of Boys in a Private School and a Public School

fourth of the pupils showed correspondence of skeletal and chronological age, that in approximately one-fourth skeletal age was less than chronological age, and in approximately one-half the skeletal age was greater than the chronological age. Somewhat more children in the private school were classed as having skeletal ages corresponding to their chronological ages than in the public school group, and the equivalent difference between the two is accounted for largely by the greater number of children in the public school group whose skeletal ages fall below their chronological ages.

SUMMARY

Assessment of skeletal development against standards of the Western Reserve University was carried out in conjunction with a study of nutrition. Roentgenograms of hand, elbow, and hip of each individual were studied. The degree of skeletal development in the three skeletal areas corresponded closely in approximately 40 per cent of cases, and in about the same proportion differences of 6 months appeared. In a small proportion there were differences between the areas of one or more years of skeletal development.

The median skeletal ages for each chronological age class, based upon the mean of all three areas, did not appear to differ markedly in the private and the public school groups. The median

skeletal ages of both of these groups of adolescents in the New York study were somewhat greater at most chronological ages than the median skeletal ages (standard age equivalents) of the Cleveland children from whom the standard roentgenograms were selected.

A larger percentage of the private school boys than the public school boys were classed as having skeletal ages corresponding to their chronological ages, and the equivalent difference between the two was accounted for largely by the greater number of cases in the public school whose skeletal ages fall below their chronological ages.

These studies, and others now in progress including the entire series of roentgenograms, are preliminary to the use of developmental status as one basis of classification of values for certain nutritional test methods.

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NOTE: We wish to express our appreciation to H. G. Fischer & Co., 131 E. 23d St., N. Y., for lending us the portable x-ray unit with which all roentgenograms in the private school were taken.

Selecting Cases of Anemia Among Adolescents^{*†}

DOROTHY G. WIEHL

Milbank Memorial Fund, New York, N. Y.

THE anemia of childhood and adolescence is, for the most part, that which results from a deficiency of iron. It is thought to be one of the relatively common deficiency diseases, although data are not available to indicate its prevalence. The requirements for iron are greatest during periods of rapid growth and, therefore, iron deficiency anemia is most likely to occur in infancy and the adolescent period. In the survey of nutritional deficiencies in high school groups in New York City it was considered essential to make a complete hematological examination, since the age group included the years when anemia is believed to be very common.

The hematological determinations made on bloods of high school pupils examined in the Nutrition Study in New York City have included those in general use for diagnosis and classification of anemia. On each blood specimen, taken by venipuncture, a

hemoglobin determination, a count of erythrocytes, and a hematocrit reading were made. From these three findings three other values are obtained by computation; namely, the mean volume of the red cell, the mean hemoglobin content per cell, and the mean hemoglobin concentration per 100 ml. of red cells. These produce the hematological values in common use for diagnosing anemias.

Since all anemias are characterized by a reduction of the hemoglobin content of the blood, accurate determination of hemoglobin is a primary requisite for selecting the cases of any anemia in any population group. Classification of the types of anemia and the etiological factors require additional laboratory determinations and even special clinical study. For general surveys or health examinations in schools, determination of hemoglobin is adequate for finding anemia. If it may be difficult to reexamine persons, or if other circumstances make it preferable, a hematocrit determination and an erythrocyte count are desirable.

The present report will be limited to a discussion of some of the preliminary findings based on an analysis of the hemoglobin values of a large number of adolescent boys and girls in New York City. The hemoglobin content was determined with the photoelectric colorimeter by the Evelyn method. One group included about 350 children, mostly Jewish, from high-income fam-

* From a cooperative investigation by the U. S. Public Health Service, Division of Public Health Methods; the Cornell University Medical College, Department of Public Health and Preventive Medicine and Department of Pediatrics; the Milbank Memorial Fund; and the New York City Department of Health.

The cooperating agencies have been assisted in carrying out this investigation by the Work Projects Administration for the City of New York, Official Project No. 65-1-97-21 W.P. 24, "Medical Evaluation of Nutritional Status."

† Based upon a report read before the Food and Nutrition Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

ilies, and a second group included over 2,000 students attending Seward Park High School on the lower East Side, a poor neighborhood. A large percentage of the low-income group was Jewish.

HEMOGLOBIN STANDARDS FOR HEALTHY ADOLESCENTS

An important problem which confronts one in attempting to interpret the hematological findings for apparently healthy adolescents is the lack of established criteria for identifying abnormal or pathologically significant variations. A number of different standards* are in current use as normal values for adults and infants, and it is recognized that normal levels differ by sex and age. For the age period between infancy and 20 years, and especially for adolescent ages, normal levels and the limits for normal variation have yet to be determined.

In 1916 Williamson² studied sex and age differences in hemoglobin content of the blood by examining blood specimens from over 900 persons in Chicago. His results have been used until very recently by nearly all workers in the field to obtain *relative* levels for children and adolescents, as compared with some "normal" level for adults. The normal hemoglobin levels used for adults have varied from 13.7 to 17.3 gm. per 100 ml. of blood. By a series of studies on different groups, Osgood³ has attempted to bring together sufficient data to improve the curve for mean hemoglobin levels for each sex for ages from 4 to 30 years. Several other studies have provided a limited

amount of data for segments of the age curve, but the hemoglobin levels reported in the various studies are so different that they cannot be pieced together.

All data show that there is a definite increase in the hemoglobin content of the blood of both boys and girls during adolescence. This increase is especially rapid and large for boys. Osgood divided the ages above 3 years into only two groups, and suggested a normal level for ages 4 to 13 years and a normal adult level which begins at 14 years of age for both boys and girls. The use of a childhood level and an adult level has been common, with the dividing age varying from 13 to 16 years of age. Such divisions are a compromise for simplicity but the values used do not adequately represent either sex at each year of age from 12 to 17 years. A careful selection of cases of iron deficiency anemia among persons of these ages requires that the values used as criteria of satisfactory hemoglobin levels be consistently good for each child.

In planning the study in New York, the need to evaluate standards for this age group was recognized. Examinations on about 350 children attending a private high school were collected for this purpose. With complete examinations and the results of a number of special tests for specific nutritional deficiencies available for each child, it is possible to select with unusual care a group of children for special study. On the basis of some finding that might affect the hematological values, 41 cases were discarded. For ages from 12 to 17 years, hematological data are available for 17 to 34 persons of each sex at each year of age.

HEMOGLOBIN VALUES BY SEX AND AGE

The mean hemoglobin content of the blood for each sex-age group is shown in Figure 1. For boys, the increase in

* The terms "standard" and "normal" are used according to traditional usage. Although they are assumed to refer to values typical of the healthy state, they are usually average values for persons who considered themselves in good health. More precise terminology is needed to indicate the significance of recommended values. The problem of standards has been more fully discussed in another paper.¹

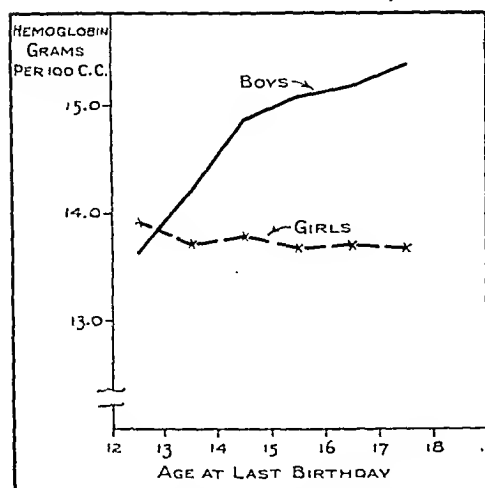


FIGURE 1—Mean Hemoglobin Values at Each Year of Age for Adolescent Boys and Girls from High-income Families

hemoglobin level is rapid at ages 13 and 14 years and continues through age 17 years, but at a reduced rate in the older ages. For girls, the highest hemoglobin value is at age 12 years, but, on the basis of this small number of subjects, it is not significantly higher than the means for other age groups. Other evidence suggests, however, that this early, but temporary, higher level for girls may be typical. In general, the means are on a level throughout this age period, and even the 12 year old girls had attained the hemoglobin level reported as characteristic of adult women.

The mean hemoglobin content of the blood for these New York City girls was higher than that reported by Os-good for girls 12 and 13 years of age in Oregon, but lower at 14 to 17 years of age. Similarly, for boys aged 12 and 13 years, the hemoglobin level was much higher for the New York City group than for the Oregon boys, but at 15 years and older it was lower. The increase with age in Oregon apparently came later and was greater and more precipitate than for this New York group.

HEMOGLOBIN VALUES AND ADOLESCENT DEVELOPMENT

Since the rapid change in hemoglobin content of the blood during these years is a physiological change associated with growth and the demand for added iron in the body, it seems logical to assume that the hemoglobin level may be more closely correlated with a child's growth or maturity than with his chronological age. Two indices of maturity are available for children in this study. One is a rating based on sexual development and the other is the skeletal age rating based on roentgenograms. Only the development ratings will be discussed at this time. The examining physicians classified each boy according to the amount of pubic hair, in one of four categories; namely, none, sparse, moderate, and abundant; and classified each girl according to breast development in one of four categories; namely, none, areolar only, moderate, and adult. Obviously, these classifications cannot be applied by any objective measurable criteria and represent only a gradation interpreted by the physician's judgment.

Among the private school group, there were no girls without breast development and only 8 were in the areolar development class. Thus, even the younger girls were classified as showing moderate breast development. No significant difference in hemoglobin levels for girls in the "moderate" and "adult" classes was found,* the mean values being 13.6 and 13.8 gm. per 100 ml., respectively. The boys, on the other hand, were distributed over the four categories. The average hemoglobin level for boys with no pubic hair was 13.5 gm., about the same as that for 12 year old boys; for those

* Other indices for sexual development for girls may give more significant classifications. For example, the interval since menarche is more objective and a preliminary study suggests that it may be a better criterion of maturity.

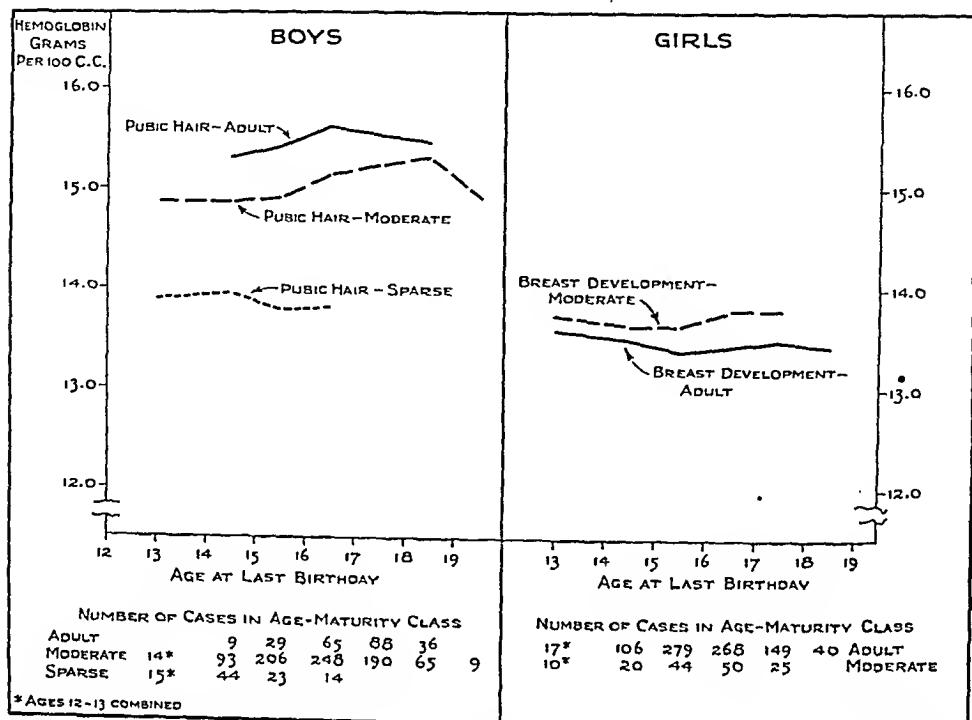


FIGURE 2—Mean Hemoglobin Values According to Sexual Development and Chronological Age for Adolescent Boys and Girls from Low-income Families

with sparse pubic hair, the hemoglobin average was 14.1 gm., intermediate between that for 12 and 13 year old boys; for those with a moderate amount the average was 14.9 gm. and corresponded with that at 14 years of age; and for those with abundant hair, the average hemoglobin value was 15.2 gm., or approximately the mean for ages 16 and over. These four categories gave nearly the same range for average hemoglobin levels as the eight chronological age groups, and the coefficient of variation (ratio of standard deviation to the mean) for each group was 5 or 6 per cent, the same as for chronological age groups.

The numbers of boys and girls of high income were not large enough for subclassification of the sexual development groups according to chronological age. For this, it is necessary to use the records for the 1,172 boys and 1,027 girls from low-income families ex-

amined at Seward Park High School. In Figure 2, the average hemoglobin content of the blood is shown for each development group according to single years of age. It is evident that the average hemoglobin levels for boys in the same developmental class but of different chronological ages are very similar. Boys 15 and 16 years of age classified by the physicians in the "sparse"-pubic-hair group had the same hemoglobin content that was found for boys 12 and 13 years of age of similar development. Boys of similar age, but more advanced in sexual development, always had higher average hemoglobin levels. The differences were much greater between groups with slight evidence of sexual development and those with moderate development than between the moderate group and adult development group. It is apparent that the changes in hemoglobin content of the blood are

closely associated with puberty, and that expected normal levels on some classification of maturity or development would provide more satisfactory standards for boys during the adolescent period than normals according to chronological age.

These differences in the mean hemoglobin levels for boys of different development, although of similar chronological age, are of such a magnitude that it is essential to take account of *development* in all cases of apparent anemia selected on the basis of age standards. An individual boy with a low hemoglobin value according to the age standard may be within normal limits if his development is less than average for his years.

The girls examined in Seward Park High School were either of moderate or adult development. Differences in hemoglobin for girls of similar age in these two stages of maturity were less than those noted for boys and are in the *opposite direction*. Thus, girls classified as having moderate breast development had, on the average, somewhat higher hemoglobin values than girls in the adult class. There is no clear explanation for the age curves for these two groups. However, these and other data suggest that an increase in hemoglobin occurs during development, but as development is completed, blood levels for girls decrease slightly. These differences are small enough that a single normal level for hemoglobin is probably satisfactory for girls who are at least moderately developed. For younger girls than those in this study, it may be important to consider development as well as chronological age.

An important implication of the differences in normal hemoglobin levels, according to maturity, is its possible relation to the wide differences reported in various studies on this age group. Thus, the differences already mentioned

in the age curves for boys and girls examined in Oregon and in New York City may reflect chiefly a later and more constant age of maturity in the Oregon group, which produced low hemoglobin levels at 12 and 13 years of age and relatively high levels at older ages. Regional, climatic, and racial differences, as well as iron deficiency, cannot be determined unless the effect of adolescent growth and development is held constant.

Associated with the increase in hemoglobin during adolescence are other changes. Since hemoglobin is carried by the erythrocytes, these must increase either in number or size. Actually, both changes occur, and the derived indices commonly used in classifying cell volume and hemoglobin content of the cells also change. These changes further complicate the problem of diagnosing and classifying anemias in this age group, but there is not time to discuss them.

HYPOCHROMIA IN THE NEW YORK SURVEY

No estimate of the prevalence of cases of iron-deficiency anemia in the groups examined in New York City will be attempted at this time. However, some indication of whether iron was a nutritional deficiency in the low-income groups may be obtained by a comparison of the mean hemoglobin levels for boys and for girls of a specific developmental age with the mean hemoglobin values for children from high-income families in the corresponding sex and developmental class. The children from low-income families were also subdivided according to whether they were Jewish or Italian. For each group of boys, the mean hemoglobin level found did not differ significantly from that for its corresponding group from high-income families. For several groups of girls in low-income families the mean hemoglobin value was signifi-

cantly lower than that for a corresponding developmental group from high-income families. Specifically, the Jewish girls of adult development and the Italian girls of moderate and of adult development had an average hemoglobin level below that for girls from high-income families. Since Italian boys had hemoglobin values similar to those for Jewish boys, it is reasonable to conclude that the low values for Italian girls are not due to racial differences. It appears, there-

fore, that few boys from low-income families were deficient in hemoglobin but some of the girls had at least a mild anemia.

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Chemical Methods for Determining the Plasma Level of Vitamin C^{*†}

H. D. KRUSE, M.D.

Milbank Memorial Fund, New York, N. Y.

METHODS for the chemical estimation of vitamin C in most frequent use are based upon the color change resulting from reduction of 2.6 dichlorophenol-indophenol.

Dye (oxidized) + l-ascrobic acid (reduced)
↓
Dye (reduced) + dehydroascorbic acid (oxidized) colorless

This dye, applied first by Tillmans¹ in determinations on foodstuffs and adapted later to the analysis of blood, reveals the amount of reduced ascorbic acid. Only this form occurs in the animal body; therefore, determination of its level in bodily fluids, with precaution against extraneous oxidation, gives a measure of their vitamin C concentration.

Methods utilizing the reaction with this dye for determination of ascorbic acid in plasma are of two types: titrimetric and colorimetric. In the titri-

metric procedures derived by Farmer,^{2,3} standardized dye in a microburette—really a capillary pipette with flow controlled by screw pressure on a rubber bulb containing mercury—is titrated into plasma until the first trace of color appears. That is the end point indicating that all the ascorbic acid has been oxidized, that the dye is now present in slight excess, and that further amounts of dye cannot be reduced. In the colorimetric method devised by Mindlin and Butler,⁴ a photoelectric instrument is used to determine the difference between the transmission of light by a dye solution, called a blank, and the dye solution and plasma, called the sample, the latter having a less intense color and therefore transmitting more light. The instrument is calibrated with known ascorbic acid solutions.

These titrimetric and colorimetric procedures each give rise to two methods on the basis of the size of sample. In his titrimetric procedure Farmer first used 2 ml. samples of plasma; later he adapted the procedure to 0.1 ml. These are known as the macro- and microtitrimetric methods, respectively. Mindlin and Butler published separate methods for photolorimetric determinations on 2 ml. and 0.1 ml., respectively. These are designated as macro- and microcolorimetric, respectively. These four methods based

* From a cooperative investigation by the U. S. Public Health Service, Division of Public Health Methods; the Cornell University Medical College, Department of Public Health and Preventive Medicine and Department of Pediatrics; the Milbank Memorial Fund; and the New York City Department of Health.

The cooperating agencies have been assisted in carrying out this investigation by the Work Projects Administration for the City of New York, Official Project No. 65-1-97-21 W.P. 24, "Medical Evaluation of Nutritional Status."

† Based upon a report read before the Food and Nutrition Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

on the reaction with indophenol dye are available for the determination of vitamin C in plasma.

Not infrequently the question is asked: What is the best method for determining vitamin C in blood? Actually the best method depends on several conditions. It is determined in part by the available resources in both test material and equipment. For instance, a micro method is better than a macro, if only a few drops of blood are available. A method is also judged by the extent to which it meets particular requirements in simplicity and rapidity. Then, too, its appropriateness is gauged by its performance within the limits of accuracy desired. Significant as are all these items in fixing the suitability of a method, its accuracy is an especially critical quality. It should be remembered that the amount of vitamin C which is to be detected in the blood is normally very small; and under certain circumstances may be infinitesimal.

The present report includes the results on an evaluation and comparison of methods. All four methods were studied, each with its specified sample size. It might be advantageous to mention the statistical methods used in the analyses of the data. In almost every instance, the problem was comparison of values: *e.g.*, the duplicate values from one method; the values from one method with those of another method or with known values. Hence, we were dealing with distributions of differences.

In the first series of experiments standardized aqueous solutions of ascorbic acid in concentration levels over a range similar to that in plasma were used. As revealed from determinations on these solutions, the macrocolorimetric method showed the greatest precision; at all concentrations the mean observed value which it yielded was very close to the standard value. None of the other methods

equalled this performance. In general, the macro showed less variability than did the micro methods. These results point to the superiority of the macrocolorimetric method which combines least bias with least variability. Indeed, it has an almost unbelievably high degree of accuracy.

When determinations by the macrocolorimetric method are conducted on plasma before and after the addition of definite amounts of ascorbic acid, the final value may be compared with the initial value plus the weighed amount of ascorbic acid. Any difference between them may be compared with the difference between duplicate determinations on the original plasma. Between the calculated and observed values for recovery the mean difference is very small and insignificant. These results indicate practically complete recovery of added ascorbic acid. From this it may be inferred that in the processing of plasma there is no loss of ascorbic acid from either interfering factors or manipulations.

But, what is more important, these results indicate that the macrocolorimetric method, which is of demonstrated accuracy for determining vitamin C in pure solutions, is of almost if not equal precision for determinations on plasma. It is therefore possible to use it in ascertaining the actual vitamin C values of plasma samples and to take these values as the basis for evaluating and comparing the other methods on plasma.

For this purpose determinations by all four methods were conducted on each plasma sample in a series extending over the usual range of concentration level. The microcolorimetric method showed lower values at all levels than did the macrocolorimetric method. These differences were very significant at all concentrations. Presenting still another pattern, the macrotitrimetric method on plasma yielded higher values

at all levels than did the macrocolorimetric method. This difference was very significant at all levels except from 0.80 to 1.19 mg., and even here it was significant. As for the microtitrimetric method, on plasma it overread at the lower and underread at the higher levels; its greatest difference from the macrocolorimetric method was at the highest concentration, 1.2 to 2.0 mg.

Thus, in contrast to the other methods, the macrocolorimetric procedure showed little or no bias. Although at high levels the microtitrimetric had greater accuracy than did the microcolorimetric method, they had equal bias, though opposite in direction, at low concentrations. The maximum bias of the microcolorimetric method was 0.07 mg. That of the microtitrimetric method, amounting to 0.10 mg. or less, was more pronounced. Both macro methods were less variable than were the micro procedures. On the basis of minimum bias and variability the macrocolorimetric method had greatest accuracy. Of lesser but still quite satisfactory precision were the microcolorimetric and microtitrimetric methods. Distinctly inferior to these was the microtitrimetric procedure. It should be appreciated that the results with the titrimetric methods reflect in large part the technician's skill as well as the inherent quality of the method.

One further point about the determination of vitamin C should be cited. There is a widespread impression that vitamin C in blood is very sensitive to destruction with loss on standing, even if refrigerated. This is an important practical consideration since often it is desired to obtain blood samples at one location and transport them to the laboratory some miles distant. It was found that the occurrence and rate of loss in vitamin C depends on the medium and temperature. Plasma kept at room temperature for 24 hours shows complete disappearance of

vitamin C. In the refrigerator it undergoes a very slight decrease in vitamin C content within 3 to 4 hours; an appreciable decrease in 24 hours; and a marked decrease in 72 hours. But whole blood or filtrate kept under similar cold conditions shows no loss during 24 hours. Indeed, kept at room temperature whole blood shows only an infinitesimal decrease in its vitamin C content at the end of 3 hours.

In appraising the nutritive condition of pupils in two high schools in New York City, one from high-income, the other from low-income families, data were obtained mostly by the macrocolorimetric method on the vitamin C level of the blood. Since both boys and girls were examined in the two schools, it is possible to analyze the data in relation to possible sex as well as income level differences. Within the same income group, that is, at each school, a somewhat smaller proportion of boys than girls have high values.

But the difference in values between the two income groups is much more marked. For both boys and girls, the peak of the frequency curve for the high-income group is located at a higher concentration level than for the low-income group and a higher proportion of the former than the latter have high values. In the high-income group 78 per cent of the 164 girls and 69 per cent of the 178 boys have levels of 1 mg. per cent, in contrast to 29 per cent of the 1,088 girls and 23 per cent of the 1,059 boys in the low-income group.

Furthermore, a greater proportion of the low- than high-income group show values at the lower concentration levels. If for the moment the 0.6 mg. level is arbitrarily taken as a dividing line, without prejudice to what may ultimately be found to be the level or zone of the earliest pathological significance, it is found that 48 per cent of the boys and 46 per cent of the girls in the low-

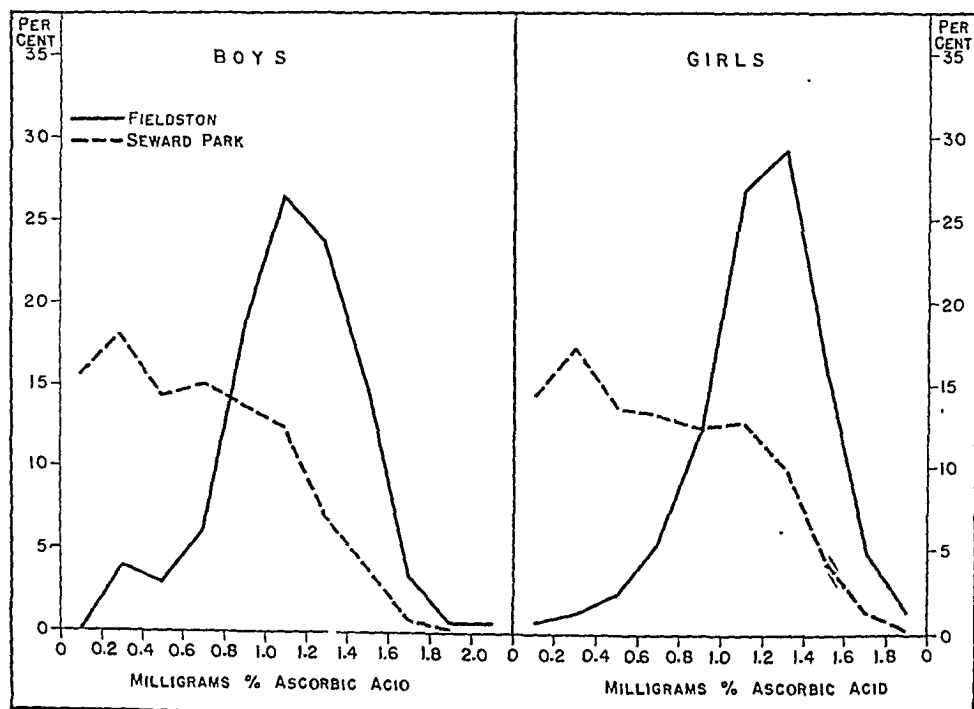


FIGURE 1—Frequency Curves for Blood Levels of Ascorbic Acid in Adolescents Grouped According to Sex and Family-income Level. The Solid Line Indicates Values on Adolescents from High-income Families; the Broken Line, from Low-income Families.

income group have concentrations less than 0.6 mg., while only 7 per cent of the boys and 4 per cent of the girls, respectively, in the high-income group have such values. Indeed, 16 per cent of the boys and 14 per cent of the girls in the low-income group show concentrations below 0.2 mg. per cent, while only one child, a girl, in the high-income group showed such low values.

It is evident that for both boys and girls a greater proportion in the low- than in the high-income group showed low vitamin C levels. This difference between the high- and low-income groups, with respect to the ascorbic acid concentration in blood is notable.

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A NEW DEPARTURE IN FEDERAL PUBLIC HEALTH LEGISLATION

A FEW months ago the Seventy-seventh Congress passed H.R. 4926 which is designated as the "Labor-Federal Security Appropriation Act 1942." This Act was approved by the President on July 1, 1941. Among other things it contains is an appropriation of \$1,200,000, "for the cost, including subsistence, but not including cash allowances to trainees, of refresher, student nurse and post-graduate nursing courses, including courses in midwifery, provided by public agencies operating public educational facilities and by hospitals and nursing schools in accordance with plans submitted by them and approved by the Surgeon General of the Public Health Service, at hospitals with recognized schools of nursing, and, where necessary, in the case of postgraduate courses at other institutions, for approved persons who have been licensed to practice as registered nurses under the laws of a State, Territory, or the District of Columbia. . . ." Payment is to be made through certification by the Surgeon General of the U. S. Public Health Service to the Secretary of the Treasury of the name of the agency, nursing school, or hospital to whom payment is to be made, in accordance with regulations promulgated by the Surgeon General.

The above action was taken by the Congress as a defense measure, and will without doubt aid in keeping a steady flow of nurses for military and civilian needs. There are, however, interesting and unusual elements in this legislation, and these will receive commendation from some and condemnation from others. Certainly such new departures in federal aid as they relate to public health deserve comment.

So far as can be learned this is the first time that the federal government has gone into undergraduate professional education on a large scale. Heretofore it has been assumed that the problem of getting into a profession—medicine, engineering, nursing—was a responsibility of the individual; that the provision of teaching staff and facilities for undergraduate instruction of this sort was an affair generally outside the scope of federal interest or responsibility. It is true that federal aid has heretofore been given to state health departments in the further training of

public health personnel, but in these instances persons receiving fellowships had already acquired a professional status. Attention is called to this difference not necessarily in criticism, but because it may, in the future, prove to have been a significant departure.

A second thing to be noted in this appropriation of funds in its relation to postgraduate courses is that the aid is limited to a particular and specified group: nurses. Fellowships provided for public health personnel under the Social Security Act made postgraduate instruction available for physicians, nurses, engineers, and specialists of various sorts, on the staff of official agencies. With no tendency to argue against the need for more and better trained public health nurses, we must at the same time wonder whether in the future physicians, engineers, dentists, and other special professional groups may not attempt to have similar limiting legislation enacted in the interest of their professions. Such a development would be unfortunate, for appropriations earmarked for this or that postgraduate profession in public health would not necessarily, in their respective amounts, reflect either the general need for training of each type of personnel or the divergent necessities in the various parts of the United States. Finally, from the standpoint of public health work, this Act, for good or ill, places federal aid in postgraduate education in an entirely new category: it provides for direct dealing between the U. S. Public Health Service and the various educational institutions which may be concerned. Referring again to the Social Security fellowships, it will be remembered that the federal funds available were allocated to the various states, and that within rather broad limits the health officer of each state made the decision as to who would receive such fellowships. Such aid as went to universities was channelled through state health departments. In general, the state health officers exercised conscientious and sound judgment in the award of these fellowships. Arrangements for aiding public health schools were, however, somewhat clumsy and roundabout, though generally workable. Now, in connection with undergraduate nursing there is no particular reason why recommendations of candidates should be made by the state health officers, for the majority of nurses will not go into public health work. On the other hand, in connection with postgraduate education of public health personnel, we are a little reluctant to see the state health officers removed from the picture, particularly as this may prove the entering wedge for breaking a traditional and fine relationship between the Public Health Service and the health departments of the several states.

On the whole it is probable, at least in this emergency, that the benefits and immediate objectives of this new departure in federal aid in public health will offset its disabilities. In such ventures, however, unsuspected implications and potentialities often arise. Minor or emergency actions may establish precedents that lead to major and chronic results.

A JOB BY THE U. S. PUBLIC HEALTH SERVICE

MOST of the officers of the United States Public Health Service who now direct its affairs went through that trying period in 1917-1918, when public health problems created by the concentration of military and civilian personnel in certain areas of the country severely taxed the resources of state and local health departments. As a result of that experience and in view of the public health implications of current defense measures, the Surgeon General and his advisers early recognized

the importance of prompt and competent assistance to the health departments of those states in which intensive defense activities are in operation.

Quite obviously, no large reservoir of trained personnel was available for the purpose in mind. Equally obviously, new personnel must be appointed and put on duty very quickly. The Surgeon General, therefore, called a conference of representatives of universities providing postgraduate instruction in public health and asked for advice as to how, in the circumstances, such personnel might best be trained. There was general agreement along four lines: (1) That there was not sufficient time to permit leisurely, academic graduate instruction of these appointees. (2) That the soundest procedure would be to provide an orientation course which would equip them to discharge the particular duties demanded by the emergency. (3) That such an orientation course could best be given by a temporary faculty of Public Health Service officers with occasional supplementary instruction from outside lecturers. (4) That part of the instruction should be in field work, under supervision.

These things decided upon, the Surgeon General detailed for temporary faculty the best Service talent available, and designated the National Institute of Health, with its excellent classrooms and laboratories, as headquarters. Field training facilities in defense areas were provided in Maryland and Virginia through the coöperation of the health officers concerned. The course consisted of four weeks' intramural instruction, ten days to two weeks under supervision in the field. Particular emphasis was directed to the following: (1) The work of the U. S. Public Health Service and other federal agencies in national defense. (2) Communicable disease control, with special stress on venereal disease control. (3) Public health administration, state and local. (4) Environmental sanitation, with special reference to defense areas. (5) Industrial hygiene, with respect to the production of defense materials. For certain personnel more intensive work was given in industrial hygiene, and a two weeks' period of instruction in mosquito control was set up in the Norfolk, Va., area.

Classes were begun in April and new groups were admitted in May, June, July, August, and September. Fifty to sixty public health workers have constituted a class. From the first five courses, including the mosquito control course, nearly 300 physicians, nurses, and sanitary engineers have been assigned to assist in defense areas in thirty-nine states and territories.

Such swift, orderly, and effective action as this is heartening, though to be expected from the Public Health Service. It is but one more indication of the desirability of entrusting to that organization such new and emergency problems as may arise in connection with the public health aspects of national defense in the United States.

Credit Lines

A Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

HOLLYWOOD PRESENTS — — —

Cordial thanks are due the motion picture industry for two recent films dramatizing themes in the realm of medicine and public health. Unfortunately, both pictures have titles which give no indication of their scientific import, but readers are urged to be on the lookout for "Dive Bomber" and "No Greater Sin."

"Dive Bomber" comes from the Warner Brothers' studio—the producers of two other memorable pictures with medical themes: "The Story of Louis Pasteur" and "Dr. Ehrlich's Magic Bullet." The latest film is devoted to research in aviation medicine and it is commendable on many counts. It shows what medicine is contributing to the progress of aviation by solving the strange and unpredictable ailments that attack pilots during high altitude flying. It also pictures the extreme care that "flight surgeons" exercise to protect the health of the men in this branch of our armed forces. Experimental research methods in aviation medicine are explained in considerable detail and with an unusual dramatic "punch." The film leaves one with the conviction that skilled medical research has been as important as improved flying craft in making it possible for man to penetrate higher and higher into the blue.

"No Greater Sin" comes from a new producing firm—University Film

Productions, Inc. This picture is Hollywood's first attempt at a dramatic treatment of problems that arise in a community where national defense industries and an army camp are located. The chief problem dealt with in the film is that of syphilis and its spread. The plot is necessarily dramatic as this film is for theatrical use only. There is, however, some very good health education material in the picture as it emphasizes the danger of quack treatment, the necessity for blood tests, and the rôle that the health official can play in venereal disease control. "No Greater Sin," despite its lurid and unfortunate title, has been endorsed by many national agencies interested in the country's social hygiene movement. Dr. Ray Lyman Wilbur, president of the American Social Hygiene Association, has said: "The picture has real value and is worthy of support. It is dramatic and medically reasonable." Dr. Walter Clarke, executive director of the A. S. H. A., has made the following statement: "The picture possesses much educational merit. It is not formally sponsored by the American Social Hygiene Association, but health officials should encourage its use in theaters for it will do a great deal of good." Dr. Clarke emphasized the fact that "No Greater Sin" does contain some medical errors of a rather minor nature. These errors, however, would not be misleading to the public and consequently the A. S. H. A. favors a wide use of the film.

Please address samples of printed matter, comments, or other editorial contributions to the editors at One Madison Avenue, New York, N. Y.

POSTERS FOR PARENTS

Appealing, refreshing, convincing—these are the words that best describe a series of nine posters that the Maternity Center Association of New York has made available. Posters possessing these qualities are sure to attain their objective. In this instance, the objective is to impress upon prospective parents some of the obligations that must be shared before and after the birth of a baby. These posters fulfil their purpose successfully.

Moreover, they are good examples of modern poster art. Extreme simplicity is used in the layout of each. The "official colors" of babyhood—"boyish blue" and "girlish pink"—form the dominant color scheme. The illustrations, which include both photographs and simple drawings, are well chosen. The copy on each poster is in keeping with the trend toward shorter captions, as indicated by the following:

Babies thrive best when parents pull together

Care for your baby—you'll find it's real fun

Expectant father—your wife needs you most when baby comes

Expectant mother—care for your baby by caring for yourself

Clinic walls can be made bright and cheerful with this series of posters. They are available in two sizes: a set of three measuring 34 inches by 20 inches, and a set of six measuring 23 inches by 20 inches. The complete set is available for \$1.00 (postpaid) from the Maternity Center Association, 645 Madison Avenue, New York, N. Y.

SAY IT WITH PICTURES

"One picture is worth a thousand words" according to an old Chinese proverb. After reviewing *Photographs and How to Use Them*, a new publication issued by the Social Work Publicity Council, one is tempted to revise the Chinese concept to read: "One picture

is worth thousands of words." This book by David Turteltaub, Ph.D., is a study of the psychology and the effective use of pictures in publicity. Among the subjects covered are ideas for pictures, pictures as symbols, how to tell stories in pictures, how to photograph intangibles, how to get pictures, and how to obtain releases from persons whose photographs are used. Each of these subjects is helpfully explained, and anyone who makes use of this book will gain a new conception of the emotional appeal of photographs.

Each section of the book is illustrated with striking examples of pictures that have been used to interpret public health and social welfare. Other notable features of this publication are excerpts from the writings of Margaret Bourke-White—one of our best known photographers—and a bibliography of useful books and magazines on photography. It should be pointed out that this book deals with photographs to take; not how to take them.

Since the time for planning annual reports will soon be at hand again, a copy of *Photographs and How to Use Them* would be of great assistance to those who want to make this year's report more attractive photographically than that of last year. This publication sells for \$1.00 per copy. If interested, write to the Social Work Publicity Council, 130 East 22nd Street, New York, N. Y.

NOTES ON NEW PUBLICATIONS

"Doctor . . . What Can I Do?" This familiar query is the very apt title of the latest booklet issued by the National Foundation for Infantile Paralysis, Inc. This publication was prepared "to promote a better understanding of poliomyelitis," and it will assuredly achieve its purpose for it is a competently written and remarkably thorough exposition of the subject. The pamphlet was designed primarily for

use in areas where there is an increased prevalence of the disease. It is addressed to parents and the information presented will answer many anxious questions and allay unnecessary fears. The material in the publication pertaining to the nature of the virus is one of the best explanations for laymen that we have encountered on this disease agent. Incidentally, a vicious fallacy regarding poliomyelitis that has gained currency among some sections of the general public is that the disease affects the victim's intelligence. This booklet points out the fact that this is untrue. Since this false notion is held in some uninformed quarters, the explanatory statement is timely. Copies of "Doctor . . . What Can I Do?" are available without cost from the Foundation, 120 Broadway, New York, N. Y.

The third publication in the Workers' Health Series (issued by the U. S. Public Health Service) tells the story of a "killer"—carbon monoxide gas. The title is "KO by CO gas." Heretofore all printed material that we have read on the subject of carbon monoxide has been as matter-of-fact as a blueprint. But the author of this leaflet has succeeded in developing copy that has some spice in it. At the same time no necessary medical advice or first aid directions have been omitted. In addition to these features, the publication is illustrated with a series of clever sketches depicting a worker giving "the KO" to CO. This publication, by virtue of its original execution and sound information, will appeal to many readers aside from the audience for which it is specifically intended. Copies of this leaflet are available, at 5 cents each, from the Superintendent of Documents, Washington, D. C.

Compliments are in order for the City Department of Public Health of New-

ton, Mass., which has designed and distributed a pamphlet to acquaint the citizens of Newton with the services of its health department. This publication has many distinctive features which make it worthy of note. In the first place, it gives an excellently illustrated summary of the measures taken by the health department to "assure every resident the best in health protection." In other respects, the report does a good job of accounting in that it shows how public funds are spent on health measures. The cover of this pamphlet is particularly striking. It is in the form of an insurance policy on which "life benefits," "annual premiums," and similar expressions are cleverly employed to set forth the "Newton Health Policy." Pamphlets such as this should arouse a warm responsiveness on the part of the public to the services of the health department. Any health agency which is seeking ways to familiarize citizens with its work should see this publication, for it is an outstanding promotional effort.

"The American Plan for Venereal Disease Control" is the title of a folder produced by the Bureau of Social Hygiene of the Department of Health of the City of New York. Four points constitute the basis of this particular "American Plan": (1) Find the Case; (2) Treat the Case; (3) Find and Control Sources of Infection and Contact; (4) Education. An introductory statement in this folder outlines the department's policy with regard to the private physician in venereal disease control activities. In coöperation with the medical societies of New York City, a list of qualified physicians, who are willing to receive patients referred by the department for diagnosis and treatment at moderate fees, has been compiled. The names of five of these physicians, selected in strict rotation, are given to each applicant for private

medical care, who makes his own final selection of a doctor. Moreover, the folder stresses the fact that all educational materials issued by the department urge examination and treatment by the family physician.

Volume I, Number I of *Office, Field, and Lab* was recently distributed to the staff of the New Jersey State Department of Health by the Department's Health Education Service. This monthly publication, written and mimeographed by departmental employees, serves to keep the entire staff informed regarding the work (and play) of the department, to supply interesting personal notes, and to present a limited amount of health education material. A publication of this sort can do a vast amount of good in creating an esprit de corps among the staff. Good luck to *Office, Field, and Lab*!

CONCERNING A PRAYER

This may seem like an odd sort of subject to comment upon in these columns, but those who value the privilege of using this country's libraries will appreciate the profound significance of a prayer delivered at the dedication of the Yale Medical Library last June. Ever since the Blitz began over Europe, news reports have told of great libraries crumbling under German bombs. Next to loss of life and human suffering, no phase of warfare seems quite so deplorable as that which wipes out priceless books and other treasures that can never be replaced. British medical journals have told of the losses sustained by the Library of the Royal College of Surgeons and other medical collections. Last winter, when the Luftwaffe concentrated its venom on the cultural nerve center of London, six million volumes went up in flames! Among the items of irreplaceable value that have been damaged is the famed collection of books and other historical

material pertaining to the life of Dr. Edward Jenner and the history of vaccination. Those who have had occasion to draw upon the resources of European libraries cannot help but feel a sense of personal loss over this destruction.

All of which should make us doubly thankful that in our country great medical libraries—such as that at Yale—are being built and expanded for the use of the medical and public health professions. A prayer delivered by the Reverend George Stewart at the Yale dedicatory ceremonies expresses in a poetic way the values that a library represents. Here is an excerpt from that prayer:

And now we dedicate this library
To the preservation of a
Varied and timeless culture,
For the enlightenment of youth,
For the comfort of the scholar,
The inspiration of inquiring spirits,
As a rebuke to cynicism,
As a refuge from contemporary strife,
As an assertion of faith,
For the steadying of the mind,
The quickening of the heart,
To the glory of past workers,
To the awakening of curiosity,
That men may here see
The pageant of thought
And be led in this day
To dare their best.

May none of our libraries—medical or otherwise—ever crumble into ashes and dust!

PROBLEMS TO THINK ABOUT

Here and now you are urged to procure a copy of *Science*, issue of August 22, 1941, so as not to miss Dr. Walter B. Cannon's article entitled "Problems Confronting Medical Investigators." A clearer and more penetrating analysis of current problems facing the medical and public health professions has not appeared heretofore. Dr. Cannon "takes stock" of the progress of medical science—pointing particularly to the "beneficent triumphs" scored over typhoid fever, diphtheria, tuberculosis,

and the increasing measure of control over many other human ailments. It is of the unsolved problems, however, that Dr. Cannon writes with special insight and understanding. Particular emphasis is placed upon the problem of senescence and the disorders associated with it, many of which are not fully understood. Since the stresses which affect the nervous system are on the increase, Dr. Cannon contends that the problems of psychiatry urgently demand the labors of many well disciplined investigators for research in this field. Likewise, the frontiers of knowledge must be pushed forward in the fields of pharmacology, heredity, and sociology. Dr. Cannon also makes a plea for the preservation of freedom for research and for young men to fill the ranks as medical investigators. An interesting phase of this analysis has to do with the physician as "a family health officer" who would be "a teacher of his people in proper diet, proper hygiene, and in ways of avoiding conditions which induce disease."

This excellent article brings into sharp focus many other problems that deserve attention. Dr. Cannon's summary of the needs that must be met in medicine and public health is a challenge to everyone interested in the conservation of life. Put this article on your compulsory reading list!

ANY SLOGANS TODAY?

We submit that public health is always in need of new slogans. This suggestion is made partly because two requests have recently been received from health officers for statements—"along the lines of a slogan"—that could be used on posters for display in health department reception rooms. Moreover, these are days when slogans are popular. The publicity materials used in the national defense program carry slogans, as do current advertising appeals. Would it not be a

good idea to coin a slogan expressing the aim or the spirit or the motive of public health that all health agencies might use? There is no doubt that slogans appeal to the public—witness the many famous examples that advertisers have employed for years in popularizing their products.

What is a slogan? An authority on the subject gives this definition: A slogan is a magic combination of words with remembrance value. The word "slogan" comes from Scotland where it is literally a battle cry. A typical slogan of the Highland clans is "Scotland Forever!" The British call slogans "haunting phrases," and that country is now rallying millions to its cause through such slogans as: "There will always be an England!" and "Thumbs up!" One of the best trade slogans yet written is that familiar one: "Say it with flowers."

A slogan must command or suggest, and alliteration helps in establishing its "remembrance value." Watch the newspapers if you are interested in composing a slogan, for good headlines are often written in slogan style.

Could you suggest an appropriate slogan for public health? We have a notion that a slogan which really catches the spirit of our profession could be used to great advantage on many types of publicity material. We propose no contests or prizes, but if any ideas occur to you—send them to the editors of "Credit Lines." Perhaps your suggestion might eventually be formally adopted as the slogan of America's public health movement!

MAGAZINE ARTICLES

Current popular magazine articles on health or of medical import:

"Uncle Sam Defines a Good Diet." E. V. McCollum, Ph.D. *McCall's Magazine*. September, 1941.

"There Is Hope for Children in Infantile Paralysis Epidemics Today."

Ross T. McIntire, M.D. *McCall's Magazine*. September, 1941.

"A Home Chart of Medical Tests." Compiled by leading medical authorities. *Good Housekeeping Magazine*. September, 1941.

"Do You Have Headaches?" Helen Furnas. *Ladies Home Journal*. September, 1941.

"Plan for Parenthood." Gretta Palmer. *Ladies Home Journal*. September, 1941.

"Laymen and Alcoholics." Genevieve Parkhurst. *Harpers Magazine*. September, 1941.

"The Attack on Brainstorms." George W. Gray. *Harpers Magazine*. September, 1941.

"Outwitting the Common Cold." Ishbel Ross. *Coronet Magazine*. September, 1941.

(The above is not presented as a complete list and the articles are not necessarily recommended.)

SOME NOTES AND SOME QUOTES

This editorial partnership (and especially one-half of it!) points with justifiable and understandable pride to the record of the Davidson County Health Department, Nashville, Tenn., in the *Rural Health Conservation Contest*. Under the direction of Dr. John J. Lentz, the department has won an annual award each year since the contest was inaugurated in 1934. Other county health units that can boast of a similar record of achievement are Pike and Lauderdale Counties, Miss., and El Paso County, Tex. These health departments deserve a twenty-one gun salute on their notable records of achievement and service. . . . An informative and practical article on *printed materials* in the health field is featured in the September, 1941, issue of the *Bulletin of the National Tuberculosis Association*. The article, entitled "Competition Keen for Public Interest," is by William S. Henderson, an

authority on graphic arts. The author gives expert advice on such topics as layout, pictures, and copy appeal. . . . A *book* to enter on your "must" reading list is a new volume by August A. Thomen, M.D., called "Doctors Don't Believe It—Why Should You?" In concise question and answer form, numerous medical fallacies are exposed and the corresponding facts in each case are set forth. The book contains excellent selections on the venereal diseases, cancer, colds, allergies, and many other topics. . . . An outstanding example of the effective use of *pictographs* (pictorial statistics) is found in the July issue of *Sales Management Magazine*. . . . Readers who enjoyed George W. Gray's *book* "The Advancing Front of Science" will be delighted to know that Mr. Gray has a second volume in preparation called "The Advancing Front of Medicine," which is scheduled for publication in the near future. . . . Is that *speech* you are going to deliver at the Annual Meeting bothering you? A good prescription for your worries can be found in a book by William Freeman and Quincy Howe entitled "Hear, Hear!" This book contains sound advice on grammar, involved sentences, figures of speech, jokes, and delivery. . . . *Quotations* of the month—from Dr. W. P. Shepard: "Never lose faith in the cause of public health. It is the most tangible and the most effective of all great movements for social betterment"; from Dr. Edward E. Strecker: "The chronic alcoholic is the person who cannot face reality without alcohol, and yet whose adequate adjustment to reality is impossible so long as he uses alcohol." . . . The recent call, sounded by Surgeon General Parran, for 50,000 well qualified young women to enroll in the nation's accredited schools of nursing deserves the support of all public health workers. An acute shortage of professional *nurses* exists today and should the country become actively

involved in a shooting war, the need for registered nurses would mount astronomically. Public health workers throughout the country are in a position to advise many young women regarding nursing careers. As the nation-wide recruitment program to enroll thousands of high school and college graduates gets under way, you can do your part by advising young women as to requirements, employment possibilities, and other phases of the profession. . . . *The Daily Worker*, communistic New York

newspaper, recently printed a "health advice" article entitled "Worms in the Intestines." More "boring from within" policy? . . . *A School of Nutrition*, the first of its kind organized, is to be opened by Cornell University. In addition to training nutrition specialists, instruction will be given to students preparing for institutional management and to chemical engineers and others training for various types of work dealing with handling and utilizing foodstuffs.

BOOKS AND REPORTS

Infantile Paralysis. *A Symposium Delivered at Vanderbilt University, April, 1941*—New York: National Foundation for Infantile Paralysis, 1941. 239 pp. Price, \$1.25.

Since publication in 1932 of a comprehensive review of the literature on poliomyelitis by the International Committee, contributions important to the understanding of the disease have been made. To recapitulate the advance in knowledge, the National Foundation for Infantile Paralysis sponsored the six lectures which are brought together in this volume.

Dr. Paul F. Clark, Professor of Bacteriology at the University of Wisconsin, opens the series with a historical resumé of the descriptions of the disease, its manner of occurrence, the nature and distribution of the causative agent, the character of susceptible host reactions, the ideas and inferences regarding sources and modes of transmission, and of treatment. Dr. Charles Armstrong, Senior Surgeon at the National Institute of Health, U. S. Public Health Service, tells what is known about the virus of poliomyelitis and what has been accomplished in adapting the Lansing strain to the cotton rat and the white mouse. Dr. Thomas M. Rivers, Director of the Hospital of the Rockefeller Institute for Medical Research, discusses current conceptions of the pathogenesis of the disease, of the nature of human resistance, of the immunological and serological phenomena, and then critically reviews the disappointments which have accompanied attempts to develop a safe, efficient vaccine and to use immune

serum in prophylaxis or treatment. Dr. Ernest W. Goodpasture, Professor of Pathology at Vanderbilt University, describes the evolution of interpretations based upon histological studies of human and animal material. He concludes with acceptance of interpretations advanced as a result of the brilliant researches of Fairbrother and Hurst, Schultz and Gebhardt, Faber, and Howe and Bodian, that the pathological phenomena are best explained as primarily due to the spread of the virus along axones, with a resultant damage and destruction of ganglion cells; and that the patterns of spread in the grey matter and the cord are determined by the pathway of entrance and the differential susceptibility of types and groups of nerve cells. Dr. John R. Paul, Professor of Preventive Medicine at Yale University, reviews what he terms the clinical, in contrast to the statistical, epidemiology of poliomyelitis. He discusses the significance of recent observations regarding the frequency of subclinical and abortive infections, and of the recovery of the virus from stools and from sewage. He then emphasizes the increased prevalence of the disease in summer, in the temperate zones and in rural areas, and the association of small epidemics with rivers and streams which have been heavily polluted with sewage. Obviously the validity of these generalizations is dependent upon adequate statistical analyses. Data available in the literature afford some support for the first two, but to accept as significant the association of occurrence of poliomyelitis with rural areas and polluted

streams is to disregard abundant evidence to the contrary.

The last lecture in the series presents the point of view of a practising orthopedic surgeon, Dr. Frank R. Ober, Clinical Professor of Orthopedic Surgery at Harvard University. It is a topical outline of what he considers to be good practice in the care of cases of poliomyelitis to minimize deformity, to insure maximum return of function, and to repair by operative procedure.

A valuable bibliography of 575 selected references is appended.

KENNETH F. MAXCY

Air Raid Precautions — First American Edition—*Brooklyn: Chemical Publishing Co., Inc., 1941. Price, \$3.00.*

A department on air raid precautions was set up in Great Britain in 1935. In 1937 an act of Parliament made it the responsibility of local authorities to insure that adequate measures for protection of the civil population were taken.

The Chemical Publishing Co. has put together in one volume for American readers ten official British reports on air raid precautions giving the procedures and methods used in the past two years. Detailed instructions and specifications are presented in these reports regarding the organization and practices for the various services required in air raid activities, such as local communication service, clearance parties, air wardens' service, structural defense, building protection, respirators, etc. Of particular interest to health officials in this country who may under future eventualities be called upon for air raid service are the sections on first aid and rescue parties, requirements for shelters, detection of poisonous gases, and decontamination services. The discussion on shelter requirements is rather extensive and includes observations and standards on floor space

needed, on time for entry with different widths of openings, the ventilation problem, and protection from gases.

The bringing together of this material into one convenient volume should be of great value to the civilian defense committees now being established throughout this country. Although the procedures adopted in Britain were drawn to meet their special conditions and under great pressure, a study of these reports should make our own preparations more efficient. SOL PINCUS

The Wonder of Life—How We Are Born and How We Grow Up—*By Milton I. Levine, M.D., and Jean H. Seligmann. New York: Simon and Schuster, 1940. 114 pp. Price, \$1.75.*

This concise little book purports to be written primarily for preadolescent and adolescent children, but the reviewer must confess that after reading it from cover to cover he felt it merited a much wider distribution. It is written in a direct, clear-cut style, in language anyone can understand, and deals with such a fundamental subject that it might well be placed in the hands of teachers and parents and made a reference book for classes of prospective mothers and fathers. The illustrations are well chosen and bring out clearly the matter presented in the text.

The glossary at the end clarifies some of the words which might be misunderstood by the younger readers although scarcely necessary for the mature.

RICHARD A. BOLT

Mental Disease and Social Welfare—*By Horatio M. Pollock. Utica, N. Y.: State Hospitals Press, 1941. 237 pp. Price, \$2.00.*

Out of a long experience in viewing the mentally ill from an especially strategic perspective, Dr. Pollock gives us the conclusions of years of observation and statistical analysis. He deals with questions that the public are ask-

ing, or sometimes the unwarranted conclusions at which the public has arrived. Of course, he is limited in his analysis by unsurmountable limitation of data. In some states the terms hospital admission, commitment and discharge mean quite different things socially from other states, and from hospital to hospital diagnostic conclusions are arrived at on different grounds. Between rural and urban, and rich and poor similar differences occur and one must always realize that the corresponding reservations have to be associated with conclusions drawn from these data. These variables are sociological phenomena of immense importance to public health generally. Dr. Pollock emphasizes this as follows:

"The variations have great significance and should be taken into account by anyone attempting preventive work. Mental disease in the future will be largely a city problem. Syphilis and alcoholism can and should be eradicated. But aside from these it appears that the complexities of our large cities require more adjustments than many individuals are equipped to make. To better the situation it will be necessary to strengthen the individual and to lessen the stresses of city life. To accomplish this task will require the united efforts of parents, teachers, physicians and social and research workers on the one hand; and of employers, industrial leaders, city managers and economists on the other."

The chronicity of much mental disease magnifies some adverse community conditions that would escape detection in the case of acute medical problems, but which are none the less significant. The book may be read with special value, therefore, by the epidemiologist. It is of importance to public health that arteriosclerosis is shown to be leaping ahead as a factor, while other mental disorders show slight or questionable increases. It is also significant that

about 5½ per cent of persons at birth may be expected to enter a mental hospital at some time, for these cases are the most aggravated cases. They have often been public health problems before admission. They stand for a large group of partial breakdowns that never reach the hospital, but continue to be a concern of the public. It is doubly significant that general paralysis shows increasing recovery and improvement as against a decreasing mortality, for it points on the one hand to the importance of follow-up and early treatment of syphilis, and on the other to potential problems associated with half functioning arrested cases that are discharged back to the community.

Dr. Pollock concludes: "The large number of patients restored to normal community life and the relatively small number that commit criminal offenses indicate that the hospital methods are well planned and are producing beneficial results to the patients and communities served."

GEORGE S. STEVENSON

Outlines of Industrial Medical Practice—By Howard E. Collier, M.D. (Edin.) Ch.B. Baltimore: Williams & Wilkins, 1941. 440 pp. Price, \$5.00.

This book covers a wide variety of subjects that embrace practically everything that can be said to have a relationship to industrial hygiene and industrial medicine. It will undoubtedly be a useful book for orienting the general practitioner and the industrial physician in England, but, naturally, certain portions have but little application in the United States. It should be particularly helpful for the small industry which does not have a well organized medical service.

The author has had a wide experience which is apparent, as one reads this book, in the comments and observations which he contributes from time to time and which are based on sound common

sense, and a first class medical background. The chapters on ventilation and lighting are good and are applicable anywhere.

Part III on industrial psychology is both good and bad. The chapter on industrial fatigue and accident proneness is especially good. In a straightforward manner, Dr. Collier draws attention to the underlying psychological factors causing accidents. However, there would be much disagreement with his sweeping statement that it is unprofitable to distinguish between a neurosis and a psychosis. It would probably be difficult for the works doctor to follow much of the material in Part III unless he had a previous knowledge of the subject.

Part IV, dealing with occupational diseases is comprehensive, accurate, and useful.

Part V, dealing with industrial forensic medicine, would apply only in Great Britain.

All in all, this is an ambitious and a useful book with a wealth of material and detail such as is not usually available in one volume.

A. J. LANZA

Employee Training in the Public Service—A report by the Committee on Employee Training — *By Milton Hall. Chicago: Civil Service Assembly of the United States and Canada, 1941. 172 pp. Price, \$2.50.*

The Civil Service Assembly, an association of public agencies, officials and private citizens interested in public personnel administration little known to many public health workers, has contributed in this small volume meat for much discussion in any public health agency. For here are brought together the fundamental principles and attitudes, together with suggestions for a practical program, whereby employees may be helped "to gain effectiveness in their present or future work through

the development of appropriate habits of thought and action, skills, knowledge, and attitudes." Who doubts that any efficient executive will feel that his organization could not profit if such improvement were possible?

Some may argue that public health is a specialized kind of public service and therefore demands such a specialized kind of training that a volume prepared by those not trained in the field can have little value. But the job of teaching a family the value of diphtheria immunization or of persuading a restaurant owner to put in a mechanical milk dispenser is not essentially different from teaching a farmer how to prevent Bang's disease or persuading a civil service bureau to install new machinery to do its tabulating work. And every public agency has similar problems in answering inquiries from citizens, in finding the time, the place, and the instructor to teach employees new methods—analogy could be continued indefinitely. These are common problems in all agencies, and this volume, based on the experience of many efforts to train employees in the public service, will be of value to the administrator interested in so-called in-service training of his staff. The book was assembled by a committee studying the subject but has been sufficiently well edited to leave few marks of its joint authorship.

Specific chapters deal, among other topics, with ascertaining the need for training, instruction, where and by whom, selecting and developing content, training methods, and evaluation.

LEONA BAUMGARTNER

Food Analysis—*By A. G. Woodman (4th ed.) New York: McGraw-Hill, 1941. 607 pp. Price, \$4.00.*

Over the period of 26 years intervening between the first and the present edition of this book, there has been a tremendous amount of published

data and a great deal of this has represented little actual improvement in basic analytical procedure. The sorting of the really important data from those which are not so pertinent has been a hard task.

The book covers the typical foods that involve basic methods of analysis and is particularly embracing in the matter of fats, oils, carbohydrate foods and alcoholic beverages. One engaged in either of these fields will have recent additions such as the Fitelson Test for Teaseed Oil in Olive Oil. The Penniman, Smith, and Lawshe method of determining fusel oil in distilled liquors, and other valuable aids are recorded in this treatise.

It is unfortunate that the author did not include more detail in some of the procedures, even at the expense of a larger volume. It is to be noted that in the section pertaining to pasteurized milk there is not included the very valuable and decisive phosphatase test, used by many of the milk agencies throughout the United States and which was devised in the laboratory of the Health Department of the City of New York, which depends upon a modification of the basic Kay and Graham test. This can be accomplished by using only one hour of incubation in the laboratory or 15 minutes in the field and then by using the very sensitive Gibbs reagent for the detection of the liberated phenol. (See this *Journal*, October, 1940, p. 1206; and Proposed Phosphatase Methods—*Standard Methods for the Examination of Dairy Products*—7th Edition—1939.)

Under the general provision relative to the detection of preservatives, particularly with reference to formaldehyde, it is regretted that mention was not made of the valuable U.S.P. test for methyl alcohol depending on the oxidation of this alcohol to formaldehyde, which is described in detail under alcoholic foods. p. 508.

In spite of the statement in the preface, that this book was intended primarily for the undergraduate student rather than for the practising chemist, the splendid compilation of authentic data, methods of analysis, and the very reasonable price, dictate that this edition be on the shelf of everyone interested in problems of food analysis.

REGINALD MILLER

School Health Services—By W. Frank Walker, Dr.P.H., and Carolina R. Randolph. New York: Commonwealth Fund, 1941. 172 pp. Price, \$1.50.

The work of the physician, nurse, and dentist in the schools has been "set in its ways" for so long that it is encouraging to find questioning, investigation, and a realization of new objectives that lead to changes in practice. As the authors say: "Too frequently its concern begins and ends with routine periodic examinations of children and pointing out of defects without consideration of the interest and ability of the community, professional and otherwise, to provide adequate treatment."

This is an extensive study of the original service records accumulated during a six year period in six counties of Tennessee. With special funds much more analysis was made of the records than is practicable in the usual health or education department program. They show definitely more vision, dental, and tonsil defects corrected when the parent was present at the examination than without the parent. They find some relationship with preschool supervision suggesting that the preschool service influences the correction of dental and throat defects. In fact, they have pointed out about all the significant information that can be obtained from service records. Their analyses of records of tonsil and nutrition defects illustrate the wide variation that occurs in subjective judgments and

suggest the inadequacy of such reports in giving a real picture of administrative procedures or accomplishments.

This report is particularly important in pointing out the limitations of rural programs that may become preoccupied with routine examinations. While it is not clear that all the recommendations come directly from the analysis of the records, they emphasize educational objectives that are in advance of common practice, and procedures that are in the opinion of the reviewer generally practical and sound.

HAROLD H. MITCHELL

Die Bakteriologie der Salmonella-gruppe—By F. Kauffmann. Copenhagen: Einar Munksgaard, 1941, 393 pp.

While it is stated in the preface that the book is not intended as a historical review nor as a textbook, in it is reviewed all the literature pertinent to the classification of *Salmonella*, and it will be found an invaluable guide for the worker undertaking the differentiation of paratyphoid bacilli by modern methods. The subject is considered under the following headings: definition and nomenclature, cultural methods of type determination, cultural characteristics of the types, serological methods of type determination, serological characteristics of the types, practical diagnosis of *Salmonella* infections, pathogenesis and epidemiology, and prevention of *Salmonella* infections. A clear and detailed account of the biochemical and serological methods used in *Salmonella* typing is given and the characteristics and occurrence of 107 serological types are described. Particular attention is given the variational phenomena (R and S, H and O, phase, and form variations) whose recognition is essential to successful type determination. Of interest is the orientation of a number of strains of coliform bacilli in the Kauffmann-White classification, indicating that the

method of antigenic analysis may be applied profitably to bacilli of that group.

In conclusion it is pointed out that the majority of the practical problems connected with this group of organisms may be regarded as solved. The etiology and epidemiology of enteric infections is understood and efficient methods of isolation and classification of the bacilli are at hand. The prevention of these infections remains only a matter of organization, technic, and financial support. There remain to be solved many problems of scientific interest, the most important of which are: the determination of the complete antigenic formulae of *Salmonella* types; the isolation of partial antigens and the determination of their rôle in immunity; further study of form and phase variations; the extension of our knowledge of the relationships of *Salmonellas* to members of other genera; further work on the toxins of the enteric bacilli; and the chemical study of *Salmonella* antigens.

The book is written in the author's usual clear and concise style and is attractively and accurately printed.

P. R. EDWARDS

Controlled Fertility—By Regine K. Stix and Frank W. Notestein. New York: Williams & Wilkins, 1940. 201 pp. Price, \$3.00.

An evaluation of clinic service dealing with patients of the oldest and largest birth control clinic in the United States, this book has great merit in sound, scientific approach to the problem of effectiveness of methods of contraception. It is equally good in its clean-cut analysis of the variables in a clinical study, such as sampling, group characteristics, reliability of data, noncontraceptive experience, effectiveness of untutored and tutored efforts at contraception, and such other factors as may influence the results obtained. It is valuable for workers in the field

of contraception and should be equally valuable on the ground of its approach to the problem for workers in other clinical fields, who wish to use accurate methods in evaluating clinical procedures.

The authors give a detailed and careful analysis of the contraceptive experience of a large number of patients before and after clinic attendance. The group is adequately broken down for the purposes of study, and the various group experiences are discussed *not* on the basis of simple success and failure—a yardstick too frequently employed and as often misleading—but on the basis of exposure and carefully determined as well as standardized rates. The effectiveness of methods of contraception, tutored and untutored, is shown together with the various factors that may have operated to produce the results.

For the individual primarily interested in the public health aspect of the problem, the chapters on the Birth Control Clinic and Public Health and Birth Control and Population Trends should be read. For clinic workers and instructors in the field of contraception the entire book offers a great fund of information. Workers in this field should pay particular attention to the discussion of rates, especially in Appendix III, the Computation of Pregnancies Rates. This offers a clear simple method of calculation, which could well be incorporated in statistical analysis of contraceptive procedures.

W. E. BROWN

Your Teeth. Their Past, Present, and Probable Future—*By Peter J. Brekhus, B.A., D.D.S. Minneapolis: University of Minnesota Press, 1941. 247 pp. Price, \$2.50.*

This book is timely. It appears when the country is particularly conscious of the part played by dental diseases in the physical unfitness of many

young men otherwise eligible for military service.

The author states frankly that the book is "a challenge to dentists to look upon their problems from a broader point of view" than has been the case during the hundred years just passed, since the establishment of the first dental school. The distribution, behavior, treatment, and probable end result of the more common dental diseases are discussed. A comparison is made of dental caries susceptibility in civilized and primitive man, and between man and experimental animals. As is quite proper, the problem of dental caries etiology, incidence, prevalence, and treatment receives the greatest attention. The many conflicting opinions, in and out of the dental profession, regarding the cause of caries are impartially presented. The two principal theories, the bacterial and the dietary deficiency, are most fully developed.

The author at one point states that one of the weaknesses in the nutritional theory is that the wealthy "whose diet is certainly not deficient in any of the elements known to be essential to general health are as much afflicted with dental ills as are the poorer classes." There may be some doubt that the possession of material wealth is an indication of an understanding of the fundamentals of proper nutrition.

The discussion of the several theories seems to lead one to the conclusion that the leaders of the different schools of thought should get together and examine objectively the varying evidence and viewpoints. It may well be that no one theory is completely wrong or wholly correct.

The concluding chapter, "How We Can Save Our Teeth," will probably be of most interest to the general reader and to the health official who is responsible for the appropriation of public funds for the prevention and con-

trol of dental diseases. The plans for providing dental services to the entire school population of the Scandinavian countries and New Zealand are discussed. Dr. Brekhus is particularly impressed by the success of the State controlled clinics of New Zealand in saving the teeth of school children.

The dental problem among Americans is developed. According to one of the authorities cited, the cost of placing the mouth of the "average American" of 1939 in a healthy condition would take \$53. Even if this estimate is discounted by 50 per cent, the resulting cost to care for the present population would amount to the astronomical figure of $3\frac{1}{2}$ billion dollars. The hopelessness of caring for the problem in such a manner is recognized and probably leads to the concluding recommendation, "The chief need in dentistry at present is that scientific research be fostered and encouraged, for only by that route may we hope for a satisfactory solution of our problem."

This book is an important contribution toward stimulating a greater interest in the problem of dental diseases and their relation to public health. A useful and extensive bibliography, both scientific and popular, accompanies each of the eleven chapters.

BION R. EAST

A Textbook of Dietetics—By L. S. P. Davidson and Ian A. Anderson. New York: Hoeber, 1941. 324 pp. Price, \$4.25.

Despite its uninspired title, this book is by no means just one more contribution to therapeutic dietetics from the standpoint of the clinician. On the

contrary, the two Scottish authors, both of whom according to Sir John Boyd Orr's foreword are physicians who have done original research on nutrition in relation to health and disease, have also produced an original text, based on lectures given to medical students at the University of Aberdeen.

The book attempts to equip the general practitioner to give sound advice on the relation of diet to the maintenance of health and to undertake with confidence the dietetic treatment of disease. To that end the customary sections on diet in health and disease are preceded by a brief general survey of the nation's diet and a concise "but for clinical purposes complete account of the physiology of nutrition." Economic considerations are never lost sight of; for each disease there are given two samples of daily diets, one for the patient with a very limited income.

The sections on therapeutic diets carry out the authors' conviction that the scientific principles underlying all dietary recommendations must be stated since "no dietetic restriction should be imposed that cannot be justified on biochemical, physiological, or clinical grounds." Moreover, the dietetic treatment of each disease is considered in relation to the associated therapy and hygiene so that dietetics appears in true perspective as a therapeutic measure.

To treat nutrition and dietetics so broadly in a book of modest size has necessitated careful selection of facts that are both well established and of practical importance. These two men must like to teach.

MARJORIE M. HESELTINE

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Children with Caries—Among the 127 children studied over the period of one year, a close correlation was found between dental caries activity and the number of *L. acidophilus* in the saliva. Other properties of the saliva revealed no significant relation to the amount of caries.

ARNOLD, F. A., and McCLURE, F. J. A Study of the Relationship of Oral *Lactobacillus acidophilus* and Saliva Chemistry to Dental Caries. Pub. Health Rep. 56, 30:1495 (July 25), 1941.

When Luftwaffe Blitzes—Recorded here are the steps taken to provide an emergency maternity service for expectant mothers evacuated from London. Pray God you will not be faced with a similar problem but, if ever you are, you will find some suggestive ideas in this paper. It is somehow reassuring to glance over all the brave articles in this issue, for they indicate that, come what may, public health administration seems bound to carry on.

BANKS, A. L., and NORMAN, L. G. Emergency Maternity Homes. Public Health. 54, 10:179 (July), 1941.

Whooping Cough Prophylaxis—Two 1 cc. doses of alum-precipitated pertussis vaccine, at a 4 week interval confer real protection against whooping cough.

BELL, J. A. Pertussis Prophylaxis with Two Doses of Alum-Precipitated Vaccine. Pub. Health Rep. 56, 31:1535 (Aug. 1), 1941.

Fifty-One Ways to Prevent Home Accidents—Do you need copy for an article, a pamphlet, or a talk on home safety? Then here is the last word. It may be assumed that the distinguished subcommittee who prepared

the "do's" and "don'ts" will be glad to have you lift their excellent ideas without credit.

* BRITTEN, R. H., *et al.* Safety in the Home. Subcommittee on Home Safety, Committee on the Hygiene of Housing. New Haven, Conn. Pub. Health Nurse. 38, 8:455 (Aug.), 1941. Reprints—single copies free from the National Organization for Public Health Nursing, 1790 Broadway, New York, N. Y.

A Better Break for Premies—Failure to provide and administer adequate care for premature infants accounts for the rather discouraging showing of the neonatal death rates. What the hospital can do to improve the situation is discussed.

DUNHAM, E. C. The Responsibility of the Hospital for the Care of the Premature Infant. Med. Woman's J. 48, 7:203 (July), 1941.

Caffeine, Benzedrine, Metrazol, *et al.*—Are there any aids that will increase work capacity, strength, and speed of movements, delay fatigue, increase endurance? You will find much of interest in the answer to these questions. An inclusive bibliography is appended.

KARPOVITCH, P. V. Erogenic Aids in Work and Sports. Research Quarterly (Supplement), 12, 2:432 (May), 1941.

Lest We Forget—Routine post-mortems upon a large hospital group revealed pulmonary tuberculosis in a quarter of all. We tend to forget that the disease in older persons is still common and may be an obstructive feature in our control program.

FREEMAN, J. T., and HEIKEN, C. A. The Geriatric Aspect of Pulmonary Tuberculosis. Am. J. M. Sc. 202, 1:29 (July), 1941.

As Others See Our Work—A sociologist looks at public health and

presents some stimulating speculations. You'll enjoy this view as seen by another scientist.

GILLETTE, J. M. Perspective of Public Health in the United States. *Sci. Month.* 53, 3:235 (Sept.), 1941.

Tuberculin Tests—Tuberculin patch tests though having a limited usefulness cannot replace in reliability the well established Mantoux test, concludes this researcher.

KERESZTURI, C. Present Status of the Tuberculin Patch Test. *Am. Rev. Tub.* 44, 1:94 (July), 1941.

Dick Reactions vs. Circulating Antibodies—Excessive doses do not immunize people who fail to respond to the usual doses of scarlet fever antitoxin. Antitoxin formation occurs more readily in those persons who show some slight amount of circulating antitoxin before the injections were begun. These are some of the findings of this study of scarlet fever prophylaxis among nurses.

KOLCHIN, B. S., and KLEIN, I. F. Immunity in Scarlet Fever. *J. Immunol.* 41, 4:429 (Aug.), 1941.

Sources of Health Information—One hundred and fifty agencies are listed from whom supplementary health educational materials may be obtained. If you need pamphlets or films or exhibits on a specific subject this useful paper will tell you where to get it.

MINER, N. M., and STEINHANS, A. H. Sources of Supplementary Materials for Health Instruction. *Research Quart.* 12, 2:266 (May), 1941.

Trichinosis in the Big City—In a hundred bodies of persons dying suddenly or by violence 22 cases of trichina infestations were discovered. This indicates that New Yorkers are enjoying an even greater incidence of infestation than the denizens of most

of the other cities from which recent reports have come.

MOST, H., and HELPERN, M. The Incidence of Trichinosis in New York City. *Am. J. Med. Sc.* 202, 2:251 (Aug.), 1941.

"Leave 'Em Where They Lie"—This excellent advice to nurses about the examination of supposedly injured persons should be read by all health workers who assume the rôle of first aiders. Make sure that the patient is moved only if it is less dangerous to do that than to leave him where he is; this should be engraved on every prospective Good Samaritan's heart.

PENDLETON, R. C. The Nurse and First Aid. *Am. J. Nurs.* 41, 8:916 (Aug.), 1941.

Eyes and Vitamins—Young children on a diet which had a vitamin A content below 100 units per kilo of body weight developed follicular conjunctivitis. Vitamin A (without D) cured the condition.

SANDELS, M. R., *et al.* Follicular Conjunctivitis in School Children as an Expression of Vitamin A Deficiency. *Am. J. Dis. Child.* 62, 1:101 (July), 1941.

A Chemist Discusses the Viruses—To a chemist it appears that there may be no sharp line of division between molecules and organisms and that the viruses may be the missing link. All the chemical study that has been lavished on these still unknown things is told in absorbing detail.

STANLEY, W. M. Chemical Properties of Viruses. *Sci. Monthly.* 53, 3:197 (Sept.), 1941.

How to Choose an Employee—If ever it becomes your job to construct an examination to measure the information of candidates for a public health position, you will find a great deal of help in this discussion of the preparation of tests.

UPHOFF, H. F., and RICHARDSON, M. W. The Construction of Objective Tests. *Pub. Health Nurs.* 33, 8:449 (Aug.), 1941.

BOOKS RECEIVED

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- GOULD'S MEDICAL DICTIONARY. Edited by C. V. Brownlow. 5th ed. rev. Philadelphia: Blakiston, 1941. 1528 pp. Price, Plain \$7.00, Thumb Indexed \$7.50.
- LABORATORY GUIDE IN ELEMENTARY BACTERIOLOGY. By M. S. Marshall. Philadelphia: Blakiston, 1941. 244 pp. Price, \$1.75.
- FUNCTIONAL HEALTH TEACHING SYLLABUS. By Lynda M. Weber. New York: Ginn, 1941. 159 pp. Price, \$1.75.
- TUBERCULOSIS NURSING. By Grace M. Longhurst. Philadelphia: Davis, 1941. 280 pp. Price, \$3.00.
- HOW TO HELP YOUR HEARING. By Louise M. Neuschutz. New York: Harper, 1940. 179 pp. Price, \$2.50.
- HANDBOOK OF COMMUNICABLE DISEASES. By Franklin H. Top. St. Louis: Mosby, 1941. 682 pp. Price, \$7.50.
- MICROBES WHICH HELP OR DESTROY US. By Paul W. Allen, D. Frank Holtman and Louise Allen McBee. St. Louis: Mosby, 1941. 540 pp. Price, \$3.50.
- SANITARY ENGINEERING. By Harry G. Payrow. Scranton: International Textbook Co., 1941. 483 pp. Price, \$4.00.
- THE VITAMIN CONTENT OF MEAT. By Harry A. Waisman and C. A. Elvehjem. Minneapolis: Burgess, 1941. 210 pp. Price, \$3.00.
- SOCIETY AND MEDICAL PROGRESS. By Bernhard J. Stern. Princeton: Princeton University Press, 1941. 264 pp. Price, \$3.00.
- NASSAU HEALTH IN 1940. Second Annual Report of The Nassau County Health Department for the Year Ending December 31, 1940. Earl G. Brown, M.D., Commissioner, Mineola, Long Island, N. Y.
- ALIMENTACION Y NUTRICION EN COLOMBIA. By Professor Jorge Bejarano. (Spanish) Washington: Pan American Sanitary Bureau.
- MEDICAL WORK OF THE KNIGHTS HOSPITALERS OF SAINT JOHN OF JERUSALEM. By Edgar Erskine Hume. Baltimore: Johns Hopkins Press, 1940. 371 pp. Price, \$3.00.
- LYMPHATICS, LYMPH, AND LYMPHOID TISSUE. By Cecil Kent Drinker and Joseph Mendel Yoffey. Cambridge: Harvard University Press, 1941. 406 pp. Price, \$4.00.
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- NURSING IN PREVENTION AND CONTROL OF TUBERCULOSIS. By H. W. Hetherington and Fannie Eshleman. New York: Putnam, 1941. 316 pp. Price, \$3.00.
- A SYMPOSIUM ON HUMAN MALARIA, WITH SPECIAL REFERENCE TO NORTH AMERICA AND THE CARIBBEAN REGION. Forest Ray Moulton, Editor. American Association for the Advancement of Science, Washington, D. C., 1941. 398 pp. Price, \$5.00.
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- FACTORS AFFECTING THE GERMICIDAL EFFICIENCY OF HYPOCHLORITE SOLUTIONS. By A. S. Rudolph and Max Levine. Iowa Engineering Experiment Station, Ames, Iowa, 1941. 48 pp. Free.
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- TRAINING AND EFFICIENCY. An Experiment in Physical and Economic Rehabilitation. By E. Jokl, E. H. Cluver, C. Goedvolk and T. W. De Jongh. Johannesburg: South African Institute for Medical Research, 1941. 188 pp.

ASSOCIATION NEWS

70TH ANNUAL MEETING, ATLANTIC CITY

TOO late for announcement in the Preliminary Program or in the September *Journal*, came news that the British Ministry of Health has appointed three distinguished delegates to attend the 70th Annual Meeting at Atlantic City, October 14-17. They are: Sir John Orr, Director of Rowett Research Institute, Aberdeen, Scotland; Sir Wilson Jameson, Chief Medical Officer of the Ministry of Health, London, England; Professor James Mackintosh, Professor of Public Health, University of Glasgow, Scotland.

The Program Committee has arranged a special session on the evening of Wednesday, October 15, so that delegates will have the opportunity to hear the last word on England's efforts for health protection in the civilian and armed forces.

The Program Committee is happy to announce that, through the good offices of the Coördinator on Inter-American Affairs and on invitation from the Pan American Sanitary Bureau and the Association, invitations have been addressed to the executive directors of federal health departments of the 20 Central and South American republics to attend the Annual Meeting. The invited representatives, many of whom have already accepted, are:

Argentina: Dr. Hugh D'Amato, Secretary of National Department of Health

Bolivia: Dr. A. Ibáñez Benavente, Minister of Public Health

Brazil: Dr. J. Barros Barreto, Director General of Public Health

Chile: Dr. Salvador Allende, Minister of Health and Social Welfare; Dr. Eugenio Suárez, Director of Health; Dr. Alejandro Flores, Advisor to Minister

Colombia: Dr. Roberto Franco, Counselor of Colombian Embassy

Costa Rica: Dr. Mario Luján, Secretary of Public Health and Social Welfare

Cuba: Dr. Domingo Ramos, Minister of National Defense; Dr. Sergio García-Marrus, Minister of Health; Dr. Felix Hurtado, Undersecretary of Health; Dr. Carlos E. Finlay, Vice-President of the American Public Health Association

Dominican Republic: Dr. Wenceslao Medrano, Minister of Health and Social Welfare

Ecuador: Dr. J. A. Montalván, Assistant Director of Health

El Salvador: Dr. Victor Sutter, National Director of Health

Guatemala: Dr. C. Estévez, Director General of Public Health

Haiti: Dr. Rulx Léon, Former Undersecretary of Public Health

Honduras: Dr. P. Ordóñez Díaz, National Director of Public Health

Mexico: Dr. Mario Quiñones, Secretary of the Department of Health; Dr. Angel de la Garza Brito, Director of the School of Public Health; Dr. Gustavo A. Uruchurtu, Chief of the Office of Health Education; Dr. Joaquín Astorga, Chief of the Rural Hygiene Office; Ing. Valdés, of the Department

Nicaragua: Dr. L. M. DeBayle, National Director of Public Health

Panama: Dr. Carlos Brin, Ambassador of Panama to the United States

Paraguay: Dr. Raúl Peña, Director of Public Health

Peru: Dr. J. M. Estrella Ruiz, Director of Public Health

Uruguay: Dr. J. C. Mussio Fournier, Minister of Public Health

Venezuela: Dr. A. Castillo Plaza, Director of Public Health

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

- John K. Altland, M.D., M.S.P.H., Barry County Health Dept., Hastings, Mich., Director
- Otto K. Engelke, M.D., M.S.P.H., County Bldg., Ann Arbor, Mich., Director, Washtenaw County Health Dept.
- Robert M. Ferguson, M.D., 612 Fourth St., Rising Sun, Ind., Director, Fourth Dist. Health Dept.
- Earle H. Harris, M.D., M.P.H., 217 Lark St., Albany, N. Y., Asst. Dist. Health Officer, State Dept. of Health
- Charles A. Kientz, Jr., Municipal Bldg., North Arlington, N. J., Executive Officer, North Arlington Health Dept.
- Llewellyn E. Kling, M.D., 4027 S. 24th St., Omaha, Nebr., Medical Director, Cass-Sarpy Health Unit
- Clifton F. McClintic, M.D., State House, Charleston, W. Va., State Commissioner of Health
- Hollis C. Miles, M.D., Rhea-Meigs Health Dept., Dayton, Tenn., Director
- A. L. Miller, M.D., State Dept. of Health, Lincoln, Nebr., State Health Director
- William B. Patterson, M.D., 303 W. 15th St., Austin, Tex., Health Officer Trainee, State Board of Health
- Albert E. Raitt, M.D., 1501 West Main St., Visalia, Calif., Health Officer, Tulare County Health Dept.
- Marion L. Shaddix, M.D., Clay County Health Officer, Ashland, Ala.
- Mary Walton, M.D., Chilton County Health Officer, Clanton, Ala.
- Harold W. Ward, M.D., Medical Director, Dist. 1, Sutton, W. Va.
- Paul L. Wermer, M.D., 409 E. Monroe St., Austin, Tex., Health Officer Trainee, State Board of Health

Laboratory Section

- Frances L. Clapp, B.A., Lederle Laboratories, Inc., Pearl River, N. Y., Bacteriologist-in-Charge, Testing Dept.
- Rosa M. Falk, M.S.P.H., 20 E. Euclid, Detroit, Mich., Student, Univ. of Mich.
- David B. Lackman, Ph.D., Dept. of Public Health, Univ. of Pennsylvania, Philadelphia, Pa., Associate
- Lieut. Frederick M. Offenkrantz, M.D., 72 Hansbury Ave., Newark, N. J., Chief, Laboratory Section, Station Hospital, Fort Jay, N. Y.

- Anna M. Sexton, Div. of Laboratories & Research, State Dept. of Health, New Scotland Ave., Albany, N. Y., Librarian
- Ralph B. Williams, B.S., Public Health Laboratory, State Dept. of Health, Cheyenne, Wyo., Acting Director
- Ralph W. G. Wyckoff, Ph.D., Lederle Labs., Inc., Pearl River, N. Y., Associate Research Director

Vital Statistics Section

- Almir Godofredo de Almeida E. Castro, M.D., Rua Voluntarios da Patria 190 Casa 12, Rio de Janeiro, Brazil, S. A., Health Officer, Federal Dept. of Health
- F. Herbert Colwell, M.S.P.H., 9 Ontario St., City Health Dept., Toledo, Ohio, Director, Div. of Vital Statistics
- Frances Sullivan, M.A., M.P.H., 208 Hygiene Bldg., Univ. of Pennsylvania, Philadelphia, Pa., Assistant Instructor in Public Health

Engineering Section

- Vaughn Anderson, B.S., Idaho Dept. of Public Health, Boise, Ida., Junior Chemist
- Edmund S. Cary, A.B., 807 N. Eldorado St., Apt. 205, Stockton, Calif., Sanitary Engineering Aide, San Joaquin Local Health Dist.
- Robert R. DeJonge, B.S., 737 S. Wolcott, Chicago, Ill., Assistant Sanitary Engineer, Cook County Public Health Unit
- Ralph J. Johnson, M.S., 203 City Hall, Peoria, Ill., Public Health Engineer, Dept. of Health
- Gilbert L. Kelso, B.A., Box 365, Morgantown, W. Va., Principal Sanitarian, State Dept. of Health
- Joseph A. Kohout, M.S., Rhea-Meigs Health Dept., Dayton, Tenn., Sanitary Officer
- Vernon G. MacKenzie, B.S., U. S. Public Health Service, 3rd & Kilgour, Cincinnati, Ohio, Passed Assistant Sanitary Engineer
- Jack E. Mathews, B.S., 721 Rogers St., Olympia, Wash., Sanitarian, Thurston-Mason-Olympia Health Dist.
- James H. Simmons, Box 300, Williamson, W. Va., Sanitarian, Mingo County Health Dept.
- Michael J. Stankewich, B.S., 65 Court St., State Dept. of Health, Buffalo, N. Y., Junior Sanitary Engineer

Industrial Hygiene Section

- Harry D. Baernstein, Ph.D., 4611 Highland

- Ave., Bethesda, Md., Associate Biochemist, National Institute of Health
- Charles J. DeSimone, M.S., 20 Oak St., Bridgeport, Conn., Assistant Sanitary Engineer (Reserve), Div. of Industrial Hygiene, U. S. Public Health Service
- Emily C. Gilsinger, 790 Grand Concourse, New York, N. Y., Industrial Nurse, Employers Mutual Liability Insurance Co. of Wisconsin
- Nathan V. Hendricks, B.S. in Ch.Eng., 12 Capitol Square, S.W., Atlanta, Ga., Chemical Engineer, State Dept. of Public Health
- Paul W. McDaniel, B.S., R.D. 3, Everett Pa., Erie Dist. Industrial Hygiene Engineer, State Dept. of Health
- Harry F. Schulte, B.S. in Ch.Eng., 4255 Maffitt Ave., St. Louis, Mo., Assistant Industrial Hygiene Engineer, State Board of Health
- Harold W. Werner, Ph.D., 4608 Rosedale Ave., Bethesda, Md., Pharmacologist, Div. of Industrial Hygiene, National Institute of Health
- Wendell C. Wyatt, M.S., 1729 Mississippi, Lawrence, Kans., Assistant Engineer, Industrial Hygiene Section, State Board of Health

Food and Nutrition Section

- Marcolino Gomes Candau, M.D., M.P.H., Caixa Postal 251, Rio de Janeiro, Brazil, S. A., Director of City Health Center (Niteroi)
- Norman Jolliffe, M.D., 39 E. 75th St., New York, N. Y., Chief, Medical Service, Psychiatric Div., Bellevue Hospital
- Samuel Rosenstock, M.S., 211 Smith St., Brooklyn, N. Y., Chemist

Maternal and Child Health Section

- Henry W. Clapp, M.D., 519 Dexter Ave., Montgomery, Ala., Associate in Charge, Div. of Maternal Hygiene, Bur. of Hygiene and Nursing, State Dept. of Public Health
- Mary B. Dale, M.D., 1035 E. Howard St., Pasadena, Calif., Physician, Maternal and Child Welfare, Los Angeles County Health Dept.
- Edward Davens, M.D., 2411 N. Charles St., Baltimore, Md., State Pediatric Consultant, Bureau of Child Hygiene, State Dept. of Health
- Herbert R. Kobes, M.D., M.P.H., State Bureau of Health, State House, Augusta, Me., Director, Div. of Medical Services
- Walter B. Mount, M.D., 21 Plymouth St., Montclair, N. J., Trustee, The Nursing Council of Essex County, N. J.
- John Newdorp, M.D., 118 Grove St., Mont-

- gomery, Ala., Obstetric Consultant, State Dept. of Public Health
- Robert E. Seibels, M.D., 1336 Pickens St., Columbia, S. C., Consulting Obstetrician, State Board of Health
- Antonio J. Waring, M.D., DeRenne Apts., Savannah, Ga., President, Savannah Health Center

Public Health Education Section

- Mary D. Carson, M.S.P.H., P. O. Box 3881, Honolulu, T. H., Public Health Educator
- Howard W. Ennes, Jr., A.B., 4428 Harrison St., N.W., Washington, D. C., Assistant Health Education Specialist, Div. of Venereal Diseases, U. S. Public Health Service
- May Hare, M.S., 110 S. Kendall, Topeka, Kans., Educational Coördinator, State Board of Health
- Isabelle M. Hopkins, A.B., 6701 Meadow Lane, Chevy Chase, Md., Director, Editorial Div., Children's Bureau
- J. Martin Kinnunen, M.D., 797 Park Ave., Meadville, Pa., President, Meadville Board of Health
- Walter J. Krupa, M.S.P.H., 528 Turner St., Allentown, Pa., Executive Secretary, Lehigh County Tuberculosis Society
- George B. Larson, State Medical Society of Wisconsin, Madison, Wis., Acting Secretary
- Vincent C. Moyer, V.M.D., 1523 N. 26th St., Philadelphia, Pa., Supervisor, Supplee-Wills-Jones Milk Co.
- Adolf Nichtenhauser, M.D., American Film Center, 45 Rockefeller Plaza, New York, N. Y.
- Martha Shamberger, B.S., 9 Howe St., New Haven, Conn., Student, Yale Univ., School of Public Health
- Dr. Gustavo A. Uruchurtu, Ave. San Juan de Letran 24, Desp. 214, Mexico City, Mexico, Chief, Office of Health Education, Federal Dept. of Health
- Catherine E. Vavra, R.N., B.S., 1627 E. Third St., Duluth, Minn., Supervisor of Health Education, City Health Dept.

Public Health Nursing Section

- Alice M. Bennett, R.N., R.F.D. 2, Putney, Vt.
- Gertrude D. Blatchford, R.N., Box 639, Fernandina, Fla., Public Health Nurse, Nassau County Health Dept.
- Irene Bower, M.S., R.N., P. O. Box 15, Marshall, Mich., Family Health Counsellor, Calhoun County Health Dept.
- Harriet B. Cook, M.A., R.N., 131 Pearl St., Red Bank, N. J., Educational Director, Monmouth County Organization for Social Service, Inc.

- Lula P. Dilworth, R.N., M.A., 1302 Trenton Trust Bldg., Trenton, N. J., Associate in Health, Safety & Physical Education, State Dept. of Public Instruction
- Estelle M. Dinkins, 750 Seventh Ave., Laurel, Miss., Public Health Nurse, Jones County Health Dept.
- Mildred Drury, State Dept. of Health, Lansing, Mich., Regional Consultant
- Mary Ferguson, B.S., 1610 Montcalm St., Indianapolis, Ind., Supervisor of Nursing Services, Crippled Children's Div., State Dept. of Public Welfare
- Grace K. Haven, 204 Waterloo Bldg., Waterloo, Ia., Director, Waterloo Visiting Nursing Assn.
- Grace I. Larsen, R.N., B.S., 309 Dinwiddie St., Portsmouth, Va., U. S. Public Health Service Nurse, City Health Dept.
- Alberta M. Morgan, Box 543, Fayetteville, W. Va., Nurse, Fayette County Health Dept.
- Edna L. Murdock, R.N., 135 Ave. D., Apalachicola, Fla., Public Health Nurse, Franklin County Health Unit
- Mary C. Murray, 2140 Pleasant Ave., Wellsburg, W. Va., County Health Nurse
- Gertrude M. Walters, 156 Elm St., Wheeling, W. Va., Senior Staff Nurse, Wheeling Chapter, American Red Cross
- Theda L. Waterman, B.S., C.P.H., 245 Melwood, Pittsburgh, Pa., Nurse Coördinator, Pittsburgh Syphilis Control Program
- Mary E. Westphal, R.N., 104 S. Michigan Ave., Chicago, Ill., Superintendent, Visiting Nurse Assn. of Chicago
- Epidemiology Section*
- Leland J. Belding, M.D., M.P.H., Waucoma, Ia., Assistant District Director, State Dept. of Health
- L. T. Coggeshall, M.D., School of Public Health, Univ. of Mich., Ann Arbor, Mich., Professor of Epidemiology
- Marion Friedman, B.S., 2454 Barclay St., Baltimore, Md., Voluntary Worker, City Dept. of Health
- Morris Greenberg, M.D., 143 W. 87th St., New York, N. Y., Epidemiologist, Dept. of Health
- Rolla B. Hill, M.D., Dr.P.H., Apartado 157, Habana, Cuba, Field Staff, International Health Div., Rockefeller Foundation
- Dr. Bernard I. Kaplan, 67 S. Highland Ave., Ossining, N. Y., Acting Director of Syphilis Control, Westchester County Dept. of Health
- James W. Moreland, M.D., M.P.H., 236 Fourth St., San Bernardino, Calif., San Bernardino County Venereal Disease Control Officer
- Jack L. Troupin, M.D., 334 Eastern Parkway, Brooklyn, N. Y., Physician-in-Training, State Dept. of Health
- Edmund G. Zimmerer, M.D., M.P.H., State Dept. of Health, Des Moines, Ia., Director, Div. of Cancer Control
- Unaffiliated*
- Charles Stewart Mott, E.D., 1400 E. Kearsley St., Flint, Mich., President, Charles Stewart Mott Foundation

DECEASED MEMBERS

- GEORGE O. ADAMS, Lawrence, Mass., Elected Member 1914, Unaffiliated
- JOHN A. O'CONNELL, M.D.V., Boston, Mass., Elected Member 1940, Unaffiliated
- DONALD W. SKEEL, M.D., Los Angeles, Calif., Elected Member 1938, Vital Statistics Section
- HARRIS R. C. WILSON, D.D.S., Cleveland, Ohio, Elected Member 1919, Elected Fellow 1927, Maternal and Child Health Section
- George Parrish, M.D., Los Angeles, Calif., Elected Member 1920, Elected Fellow 1929, Health Officers Section

WANTED: The following issues of the *American Journal of Public Health*—

April, 1911
February, 1937

January, 1938
February, 1939

The American Public Health Association will be glad to pay postage for the *Journals*.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearing house on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

UNASSEMBLED EXAMINATIONS IN WEST VIRGINIA

The Merit System Council of West Virginia, Box 873, Morgantown, has announced that it is expected that unassembled examinations will shortly be given for the following positions in the West Virginia State Health Department.

<i>Position</i>	<i>Salary per month</i>
Chief of Medical Services.....	\$325-\$400
Ophthalmologist	275- 350
Director of County Health Work.....	350- 400
Director, Maternal & Child Hygiene.....	350- 400
Director, Communicable Diseases	350- 400
Director, Vital Statistics	350- 400
Director, Industrial Hygiene	350- 400
Assistant Director, Maternal & Child Hygiene.....	320- 375
Assistant Director, Communicable Diseases (Venereal).....	320- 375
Assistant Director, Tuberculosis	320- 375
Venereal Disease Consultant	320- 375
Senior Health Officer	320- 375
Junior Health Officer	280- 320
Health Officer Trainee	\$200

Residence in West Virginia has been waived in consideration of the applications for these positions. However, residents of the state may be given preference in making appointments. Complete information may be obtained by writing to the Merit System Council.

LOS ANGELES CIVIL SERVICE

The Los Angeles County Civil Service Commission has announced an examination for the position of Medical Director at Olive View Sanatorium, Los Angeles County, Calif., for which applications will be received until October 15. This will be an open, competitive examination, salary to be \$500 a month. Applicants must be male United States citizens between the ages of 35 and 55, graduates of an approved medical school, with at least 5 years' experience as a specialist in the treatment of tuberculosis. Three of these years must have been in a responsible administrative capacity in a sanatorium or hospital. The sanatorium cares for 1,150 patients directly, and about 400 indirectly. Application blanks and information can be obtained from the Civil Service Commission, Room 102, County Hall of Records, Los Angeles, Calif.

VACANCY IN LOS ANGELES CITY HEALTH OFFICER POSITION

The City of Los Angeles is seeking qualified applicants for the position of City Health Officer paying a salary of \$7,200 per annum. While the city charter requires that candidates for this position be residents of the City of Los Angeles if possible, if insufficient competition for this examination is obtained, candidates who do not reside in the city may become eligible if they are otherwise qualified. From the experience of other agencies in this area it is probable that insufficient competition will be obtained and that it will be necessary to waive the residence requirements.

The City Health Officer is the Chief Administrative Officer of the City Health Department and plans and administers a broad public health program, including medical and inspectional services. He is responsible for the proper enforcement of health laws and ordinances and the prevention and control of communicable disease in the city.

Public health physicians who are interested in this position should communicate with the Los Angeles City Civil Service Commission, Room 11, City Hall, Los Angeles, California, for further information.

U. S. CIVIL SERVICE COMMISSION

The Commission has announced that applications will be received for positions as Senior Medical Officer (\$4,600), Medical Officer (\$3,800), and Associate Medical Officer (\$3,200) for appointments in the Public Health Service, with the Food and Drug Administration, Veterans' Administration, and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington.

Junior Public Health Nurse. A civil service examination for Public Health Nurse (\$2,000) has been open for some time. Nurses who have been unable to qualify for this examination because of the experience requirement now have an opportunity to qualify through a new Junior Public Health Nurse examination (\$1,800) which requires no experience. Applications are also being received for examinations now open for Junior Graduate Nurse (\$1,620) and Graduate Nurse for general staff duty (\$1,800). Further information and application forms may be obtained at any first or second class post office or from the Civil Service Commission, Washington.

POSITIONS AVAILABLE

Young woman, trained in Home Economics, for group contact work in behalf of an important commercial organization whose products are useful in the protection of public health and the National Nutrition Program. Experience in the public health field or related fields is essential. Office in New York, some travel involved. Write Box H, Employment Service, A.P.H.A.

Public Health Engineer with the Department of Health of a city of 100,000 population in the Midwest. Give age, training, experience, and references. Write Box M, Employment Service, A.P.H.A.

Southern State Department of Health seeks physicians qualified by training and experience as County Health Officers or as Pediatricians. Write Box B, Employment Service, A.P.H.A.

Western State Department of Health will consider applications from physicians with experience and a degree in public health. Write Box S, Employment Service, A.P.H.A.

Physician with public health training to serve as full-time County Health Officer in rural South Atlantic area. Salary \$3,600 to \$4,000. Write Box C, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have four months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expense, increase to \$1,700 within 6 months. Saginaw County Health Department, Saginaw, Mich.

The State Department of Social Security and Welfare, Crippled Children's Division, of Phoenix, Ariz., has three vacancies to be filled. Examinations will soon be held for orthopedic nursing consultant, nurse-physical therapist, and medical social worker.

Further information may be obtained by writing to the Merit System Supervisor, Room 208, 128 North First Avenue, Phoenix, Arizona.

PHYSICIANS WANTED IN CINCINNATI

Carl A. Wilzbach, M.D., Commissioner of Health of Cincinnati, has announced that there are vacancies for white male physicians, aged 23 to 50, graduates of recognized colleges of medicine, licensed to practise in Ohio, for appointment to the Cincinnati Health Department. Duties include surveillance over communicable disease, infant and child welfare work, medical service for sick poor, epidemiological surveys of communicable disease, examinations for work certificates, school teachers, etc., vaccination, medical school inspection. Salary \$2,640 to \$3,360 plus transportation allowance of \$240 per annum. Eligible for a retirement system. Persons interested should communicate with Dr. Wilzbach, Commissioner of Health, City Hall, Cincinnati, Ohio.

POSITIONS WANTED

ADMINISTRATIVE

Physician, M.D. Tulane, M.P.H. Johns Hopkins, age 31, experienced as health unit director, prefers administrative position in the South. A-488

Physician with M.P.H. from Johns Hopkins 1924, experienced as state director for communicable diseases, as county health officer and as director of field training center, will consider responsible position with good income. A-483

Physician, age 35, with Dr.P.H. from Harvard and experienced in administrative tuberculosis control, will consider a good administrative position. A-476

Dentist, University of Pittsburgh, D.D. S., M.P.H. University of Pennsylvania 1941, experienced in practice, wishes an administrative position in public health, preferably at state level. M-450

HEALTH EDUCATION

Woman with M.S. in public health, University of Michigan, and Ph.D. in health education, New York University, experienced in public schools, teachers colleges, and community public health, now employed as health teaching supervisor, will consider position in school, organization, or industry. H-236

Young woman with Master's degree in Health Education, Teacher's College, Columbia University, and background of clinical laboratory work and biochemistry, seeks position as health educator in research or as laboratory assistant in public health. H-494

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. H-497

Woman, M.S. in public health, excellent graduate training in education, 8 years' experience as business executive (sales and publicity). Just completed year's research in community education. Seeks good administrative position. H-496

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

LABORATORY

Milk Sanitarian and Technologist, age 37, Ph.D. Bacteriology, Wisconsin, 10 years' experience in milk and food sanitation from industrial and official angle, seeks administrative position with opportunity for research or investigational work preferred. L-381

Experienced Bacteriologist, man, 56, with long record as successful university teacher, research worker, and head of department of bacteriology and public health, desires new location in educational, research, or public health organization. Available at once. L-462

Experienced woman bacteriologist, now employed, graduate Iowa State College 1925, 6 months on Fellowship at Johns Hopkins 1930, wishes position in serology, immunology, bacteriology or research. L-458

Experienced laboratory technician. Woman with 17 years in large midwest municipal laboratory. Has 12 years' background in the Kahn test. Excellent references. Immediately available. Will consider any location. L-460

SANITARY ENGINEERING

Engineer, age 38, 3 years' experience as district sanitary supervisor, state department of health, together with work on plumbing, heating and ventilation. Will consider position in the plumbing or heating field or state department of health. Prefers middle western or western states. E-453

Public Health Engineer, M.S. Harvard, experienced in public health and industrial hygiene, wishes position of better sort in public health engineering or industrial hygiene. E-470

Public Health Engineer, M.S. Harvard, with more than 10 years' experience including 5 years with state division of sanitation, is available. E-468

STATISTICAL

Public Health Statistician. Young man, M.S.P.H. Michigan, now employed as supervisor of state health project, experienced in medical research, epidemiology studies and vital statistics, seeks position in city or state health department in Midwest. S-458

Opportunities Available

PUBLIC HEALTH PHYSICIANS—(a) Physician well trained in epidemiology to participate in syphilis control program; around \$3,000. (b) Young physician experienced in public health and tuberculosis, particularly fluoroscopy; opportunity to gain experience in communicable disease control immunization; \$3,300, mileage; West. (c) Director for local health department; \$4,000, plus travel allowance of \$500; county has population of 20,000; Midwest. (d) Young physician for staff of national organization; public speaking and teaching ability advantageous; \$3,000, adequate travel allowance. (e) City physician; western state capital. (f) City-county physician; ample assistance from all members of county medical society; \$3,000, travel allowance. (g) Physician for rural health service; around \$300, mileage; Southwest. PH10-1, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

BACTERIOLOGISTS—(a) Municipal health department; degree and experience required; \$125-\$150; Midwest. (b) Assistant bacteriologist; city health department; Chicago area; around \$125. (c) Bacteriologist; state health department; degree required; must be trained bacteriology, chemistry, parasitology; central state. (d) To assist in research problem in milk tests; experiments conducted on farm; Indiana. PH10-5, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—(a) Senior nurse and executive director for well organized visiting nurse association; industrial city of 50,000, not far from metropolitan center; \$150, mileage, two weeks' sabbatical leave for illness. (b) County health nurse, \$1,800, plus \$500 travel allowance. (c) Educational director; active community health association; academic and public health nursing degrees required; \$175-\$250; South. (d) School nurse; Chicago area. PH10-3, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

SEROLOGISTS—Senior and junior serologists for appointments with state board of health; should be familiar with other diagnostic laboratory work, also; salary for senior serologists, \$150-\$200; for junior serologists, \$110-\$150. PH10-4, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—(a) For well organized student health department in state university; work is largely of out-clinic type, with some opportunity for teaching; offices located in university hospital; hours, 9-5. (b) Men's division of university health department; physician with teaching experience preferred; Midwest. PH10-2, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

Situations Wanted

PUBLIC HEALTH PHYSICIAN—B.A., M.D. degrees, eastern schools; M.S.P.H., University of Michigan; several years' successful experience as director district health department; seeks more responsibility, better opportunity. PH10-6, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—B.S. degree, state university, with major in public health nursing; 8 years' experience in tuberculosis and public health nursing; served as director of visiting nurse

association for several years; taught in public schools before entering training school; age 36; will go anywhere. PH10-7, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

BACTERIOLOGIST—B.S., M.A., Ph.D., large university; splendid experience in teaching and research; 8 years, serologist, large hospital, metropolitan area. PH10-8, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

NEWS FROM THE FIELD

TEXAS JOURNAL OF PUBLIC HEALTH

THE Texas Public Health Association, with offices in Austin, has announced the launching of a monthly periodical beginning with November, 1941, under the masthead of "The Texas Journal of Public Health."

The association has created an Editorial Board comprised of a representative from each section and an additional person who acts as coördinator. The *Journal* will be sent without additional cost to each member of the Texas Public Health Association paying dues. Alan C. Love, M.S., is the Executive Secretary and George A. Gray, M.D., is President of the Texas Public Health Association.

So far as is known, this is the first periodical sponsored by a state public health association affiliated with the American Public Health Association.

PLAGUE CONTROL CONFERENCE

A PLAGUE control conference called by Surgeon General Thomas Parran of the U. S. Public Health Service was held in Salt Lake City, Utah, August 28 and 29, and was attended by health officers from California, Oregon, Washington, Nevada, Montana, Idaho, Wyoming, Utah, Colorado, Arizona, New Mexico, and North Dakota.

Pointing out that infection among wild rodents has progressed steadily during the last several years from the Pacific Coast eastward, Dr. Parran announced that infection among rodents has now been discovered as far east as North Dakota. The purpose of the conference was the stimulation of rat-control programs in urban and rural

areas. Since 1900 the Public Health Service reports that there have been 502 human cases and 315 deaths in this country. Two human cases of plague, both in California, have been reported in 1941.

U. S. OFFICE OF HEALTH DEFENSE AND WELFARE SERVICES

ON September 3 President Roosevelt created the Office of Health Defense and Welfare Services in the Office for Emergency Management, issuing a proclamation detailing the functions of the agency and naming Paul V. McNutt, Federal Security Administrator, as director.

According to the press, the chief effect of the move is to change the title and organizational position of Mr. McNutt in the defense structure. He has occupied the position as Head of the Office for Coördination of Health, Welfare and Related Services in the Council of National Defense. It was indicated that the new organization would not replace the Office of Civilian Defense in health and welfare matters.

The chief duties of the new agency were outlined in the proclamation as follows:

Subject to such policies, regulations and directions as the President may from time to time prescribe, the office shall:

A. Serve as the center for the coördination of health and welfare services made available by the departments and agencies of the Federal Government, and other agencies, public and private, to meet the needs of state and local communities arising from the defense program and take necessary steps to secure the coöperation of the appropriate federal departments and agencies relative thereto.

B. Make available to states and localities,

upon request, the services of specialists in health and welfare activities to assist in the planning and execution of such local and state programs.

C. Study, plan and encourage measures designed to assure the provision of adequate defense health and welfare services to the citizens of the nation during the period of emergency, and coördinate studies and surveys made by federal departments and agencies with respect to those fields.

D. Keep the President informed with respect to progress made in carrying out this order, and perform such related duties as the President may from time to time assign or delegate to it.

TENNESSEE PUBLIC HEALTH ASSOCIATION

AT a recent meeting the Tennessee Public Health Association elected the following new officers to serve for the ensuing year:

President: L. M. Graves, M.D., Memphis
President-Elect: W. H. Enneis, M.D., Knoxville
Vice-President: J. J. Lentz, M.D., Nashville
Secretary-Treasurer: R. H. Hutcheson, M.D., Nashville

BRAZILIAN FEDERAL DEPARTMENT OF HEALTH REORGANIZED

ACCORDING to the correspondent of the *Journal of the American Medical Association*, President Vargas through a decree has reorganized the National Department of Health of Brazil. The Federal Bureau of Health through this reorganization attains a status near that of a Ministry. All activities related to problems of health under the federal government with the exception of those concerning the child have been consolidated under a general director in the Ministry of Education and Health. The Oswaldo Cruz Institute, which has been an independent institution of research and study in the general field of experimental medicine, has been included in the federal bureau. According to the decree, the National Department of Health will promote surveys and research relating to health, sanitation and hygiene, the epidemi-

ology of diseases and the methods of their control and treatment, and will directly administer the activities connected with these problems and others related to health. Dr. J. de Barros Barreto has been appointed Director General of the department.

Among the new functions of the Oswaldo Cruz Institute is the education of public and medical specialists and the course of hygiene, and public health has been transferred from the medical school of the University of Rio de Janeiro to the Institute.

THEOBALD SMITH AWARD

A THEOBALD SMITH AWARD consisting of a bronze medal and \$1,000 has been established with the American Association for the Advancement of Science by Eli Lilly and Company of Indianapolis. It is to be given yearly for "demonstrated research in the field of the medical sciences, taking into consideration independence of thought and originality." The research is not to be judged in comparison with the work of more mature and experienced investigators, and in judging various researches special consideration is to be given to the independence of thought and the originality shown. Any investigator who is less than 35 years of age on January 1 of the year in which the award is to be made and is a citizen of the United States is eligible. Nominations must be received before May 1 each year, and are to be sent by Fellows of the A.A.A.S. to the Secretary of Section N, Dr. Malcolm H. Soule, University of Michigan, Ann Arbor.

SETON HALL COLLEGE NURSING COURSES

THE School of Nursing Education of Seton Hall College, Newark, N. J., has announced a one year program of study in public health nursing, intended for qualified nurses who wish to prepare themselves for staff positions, if they have not had any professional courses

previously, and for those who wish to improve their educational background in the field of public health nursing. Credits earned in this program may be applied toward the degree of Bachelor of Science in Nursing Education with a major in Public Health Nursing.

Caroline di Donato, R.N., is the Director of Public Health Nursing in charge of the courses.

HEALTH PROJECT FOR BURMA ROAD

THE U. S. Public Health Service has announced that a group of sixteen men have been assigned to protect the health of the Chinese workmen building a railroad to parallel the Burma Road through 300 malaria-infested miles in China.

Formed at the request of the Chinese Government, the unit will be in charge of Dr. Victor H. Haas, U. S. Public Health Service, who, with Edward Wright, Sanitary Engineer of the Rockefeller Foundation, were to leave San Francisco for China late in August. Others who will serve with the unit include Dr. Marshall C. Balfour, International Health Board, Dr. Thomas H. Tomlinson, Jr., Public Health Service, William A. Jellison, entomologist, Public Health Service, Fred W. Thomas and Edward R. Lacey, sanitary engineers lent by the Tennessee Valley Authority, Gordon Smith, entomologist of the Tennessee Valley Authority, Dr. Fred B. Manget, who will supervise medical care of laborers, and Dr. Paul H. Stevenson of the China Medical Board. The group will be known as the Medical Commission to the Burma-Yunnan Railroad. It is reported that the U. S. Government has allocated \$1,150,000 of lease-lend funds to the work.

DIVISION OF MENTAL HYGIENE IN OREGON

A DIVISION of Mental Hygiene under the Oregon State Board of

Health has been established with Dr. Curtis R. Chaffin of Portland of the U. S. Public Health Service as organizer. It is planned that this will be a co-operative venture with the existing facilities for mental hygiene in Oregon.

DR. MCCOWN NEW MEDICAL DIRECTOR OF AMERICAN RED CROSS

THE National Headquarters, American Red Cross, has announced that Albert McCown, M.D., Dr.P.H., has been appointed Director of medical and health service effective September 1, succeeding Dr. William DeKleine, who has been given leave until the date of his retirement. Dr. DeKleine has served continuously with the American Red Cross since 1928 and has been especially interested in the programs relating to pellagra, volunteer blood procurement and other medical and public health measures.

Dr. McCown, who is a graduate in medicine and public health from Johns Hopkins University, served during the World War with the American Expeditionary Forces in France, practised medicine in Tacoma and Seattle, Wash., served as Director of Child Hygiene with the Washington State Health Department, as Director of the Division of Maternal and Child Health of the U. S. Children's Bureau, as Deputy Commissioner of Health in the Michigan State Health Department and as Chief of the Research and Training Unit of the Bureau of Child Hygiene of the New York City Department of Health.

CHILD HEALTH WORK IN CALIFORNIA

THE University of California Medical School is coöperating with the State Department of Health in expanding child health work in the state. Dr. Sydney Sinclair, formerly instructor in pediatrics at Yale University School of Medicine, has been appointed associate in pediatrics in California where part

of his time will be spent in teaching, and in addition he will be a pediatric "circuit rider" traveling over the state as agent of the state health department, acting as consultant for county medical societies, individual physicians and groups involved in the care of children.

The new plan is an extension of the postgraduate well baby program started over a year ago which is under the direction of Dr. Amos Christie, associate professor of pediatrics in the medical school.

KANSAS MEETING ON NUTRITION

GOVERNOR Payne H. Ratner of Kansas has appointed a committee on nutrition as part of the defense program. Margaret M. Justin, Ph.D., Dean of the Division of Home Economics at Kansas State College is Chairman and Dr. Paul E. Belknap physician member. The first meeting will be held in Topeka, October 17-18.

UNIVERSITY OF MICHIGAN SCHOOL OF PUBLIC HEALTH

DR. HENRY F. VAUGHAN, recently Commissioner of Health of Detroit, Mich., has been appointed Dean of the new School of Public Health, University of Michigan, Ann Arbor. Dr. Vaughan, who is Professor of Public Health, was also made Chairman of the Department of Public Health Practice.

Public health work at the University of Michigan has been shifted from the Division of Hygiene and Public Health with the transfer of Dr. John Sundwall, Professor of Hygiene and Public Health, and of Dr. Nathan Sinai, Professor of Public Health, to the new School of Public Health.

Other new members of the faculty include Dr. Thomas Francis, Jr., Professor of Epidemiology and Chairman of the department; Dr. Lowell J. Coggeshall, who is Professor of Epidemiology, as well as Dr. Charles F. Mc-

Khann, M.D., Professor of Child Health in the School of Public Health and Professor of Pediatrics in the Department of Pediatrics in the Medical School; Kenneth A. Easlick, D.D.S., Assistant Professor of Public Health Dentistry; G. M. Ridenour, Ph.D., Associate Resident Lecturer in Environmental Health, and Harold E. Pearson, M.D., Instructor in Epidemiology.

Among the newly appointed non-resident lecturers in the School of Public Health are Carl E. Buck, Dr.P.H.; Bernard W. Carey, M.D.; Bruce Douglas, M.D.; Haven Emerson, M.D.; William G. Frederick, Sc.D.; Matthew Kinde, M.D.; Carey P. McCord, M.D.; Kenneth F. Markuson, M.D.; William S. Sadler, M.D.; Clarence Selby, M.D.; Lillian Smith, M.D., and Marguerite Wales, M.A.

The School of Public Health offers in the field of public health nursing the Bachelor of Science in Public Health Nursing and the Certificate in Public Health Nursing. The School of Public Health offers the degree of Master of Public Health for graduates in medicine, dentistry, engineering, and those who have the bachelor's degree in public health nursing. The same degree is offered to graduates of accepted undergraduate schools who have had courses which give a satisfactory background in the natural, physical, and social sciences. For the degree of Doctor of Public Health, candidates must be graduates of an approved medical school and complete the courses leading to the degree of Master of Public Health.

It has been announced that plans are complete for a new building in which to house the school, to be occupied late in 1942. In addition to appropriations from the University, funds have been given by the W. K. Kellogg Foundation and the Rockefeller Foundation for construction of the building and for the operation of the school.

Dr. Vaughan has announced that the

scope of teaching in the field of epidemiology, of virology and in tropical diseases is being broadened under the supervision of Drs. Francis and Coggeshall. Currently special concern is being given to the training of virologists through funds provided by the National Foundation for Infantile Paralysis.

NEW HEALTH UNIT IN OKLAHOMA

DR. LOWELL L. STOKES, Anadarko, Health Officer of the Caddo County Health Department, has been placed in charge of a newly created unit in Okmulgee County. Dr. William A. Loy, director of the Ardmore department, and for the past year doing graduate work at Harvard University, has been assigned to Cleveland County. Physicians who have spent the past year in graduate health study and have returned to work with the State Department of Health include: Frank P. Bertram, D.D.S., Oklahoma City; Harry E. Barnes, M.D., of the Bryan County Health Department; Vance F. Morgan, M.D., Lawton and Ferdinand

H. Hasler, Jr., M.D., director of laboratories of the State Health Department. Dr. Lloyd H. Gaston of the U. S. Public Health Service has been assigned to work in Oklahoma as part of the co-operative policy planned in defense areas.

TEXAS CHANGES IN HEALTH OFFICERS

DR. HAROLD C. SHILLING, Ft. Worth, has been made director of the Hunt County Health Unit, replacing Dr. Henry C. Wilson, Greenville, who has been appointed to the Tyler-Smith counties health unit. Dr. Wilson succeeds Dr. Robert L. Cherry, Tyler, who has been appointed field director of county health units for the State Department of Health. Dr. John H. Finn, Refugio, was appointed health officer of Refugio County, succeeding Dr. Haddon B. Woods, who is in the Army. Dr. Bennett A. Wight, Kermit, has been placed in charge of the Gregg County Health Department. Dr. Sylvester S. Munger is city health officer of Marlin.

PERSONALS

Central States

IRMEL W. BROWN, M.D.,† formerly Health Officer of Kalamazoo, Mich., who has returned from a year's study in public health, has been appointed Director of a new city-county health unit which has been established in Kalamazoo County.

ROBERT CAMERON, recently Assistant Sanitary Engineer of the Calhoun County Health Department, Mich., has been appointed Sanitary Engineer of the Washtenaw County Health Department, Ann Arbor.

CLIFFORD C. CORKILL, M.D.† of Menominee, Mich., is to resume his position as Director of the Menominee County Health Department, after a 9 months' leave of absence to

study for a master's degree in public health at Johns Hopkins University School of Hygiene and Public Health.

CLARE GATES, DR.P.H.,* has resigned from Region Five of the WPA, whose headquarters are in St. Paul, as Regional Welfare Supervisor and Public Health Consultant, to accept a position as Executive Secretary to the Health and Medical Care Division of the Minneapolis Council of Social Agencies.

VIDA H. GORDON, M.D.,† of Lansing, Mich., has been appointed Director of the Sanilac County Health Department.

THEODORE R. MEYER, M.D.† who had

* Fellow A.P.H.A.

† Member A.P.H.A.

served as Health Officer of St. Louis County, Mo., has entered active service in the U. S. Navy at Corpus Christi, Tex. He is succeeded by DR. EDWARD G. MCGAVRAN,[†] formerly of Monongalia County, W. Va. AUGUST C. ORR, M.D., of Newberry, Mich., has resigned as Director of the Luce-Mackinac District Health Department to enter private practice in Bismarck, N. D.

EDWIN H. PLACE, M.D.,[†] has resigned from his position with the Health Unit in Dickinson County, Mich., and is now in Montgomery, Ala. He was succeeded by DR. ALEXANDER WITKOW,[†] of Brooklyn, N. Y.

NELSON J. ROBBINS, M.D., of Negawnee, Mich., has been named City Health Officer. During the 37 years Dr. Robbins has practised in Negawnee, he has served four terms as Mayor and several years as Health Officer.

BUELL H. VAN LEUVEN, M.D.,[†] of Petoskey, Mich., who was Acting Director of the Menominee County Health Department, Mich., is now Director of the Grand Traverse County Health Department.

Eastern States

PAUL W. BARENBURG, C.P.H.,[†] of Cambridge, Mass., has been appointed Public Relations Secretary of the Passaic County Tuberculosis and Health Association, Paterson, N. J., succeeding M. J. PLISHNER, M.P.H., who has been appointed Public Relations Director of the Brooklyn Tuberculosis and Health Association.

AARON WILSON BROWN, M.D., formerly of Rochester, Pa., has been appointed Venereal Disease Control Officer of Richmond, Va. He succeeds DR. CLYDE F. ROSS, who served on a part-time basis.

HAROLD D. CHOPE, M.D.,* Newton, Mass., recently Health Officer of that city, and Associate in Public Health

Administration at the Harvard School of Public Health, has accepted a staff position with the Rockefeller Foundation, and will be located in Sao Paulo, Brazil.

MARY E. CORCORAN, R.N., recently Superintendent of Nurses at the New Jersey State Hospital at Greystone Park, has been appointed Psychiatric Nursing Consultant in the Section on Mental Health Methods, effective September 1, with the U. S. Public Health Service.

ARTHUR H. CUMMINGS, M.D.,* formerly of Binghamton, N. Y., has been appointed Health Officer of Portsmouth, Va.

THOMAS FRANCIS, JR., M.D.,[†] Professor of Bacteriology and Director of the Bacteriologic Laboratories, New York University College of Medicine, has been appointed Professor and Head of the Department of Epidemiology at the new School of Public Health at the University of Michigan, Ann Arbor.

VLADO A. GETTING, M.D.,[†] recently Assistant District Health Officer of the Massachusetts Department of Public Health in Worcester, has been promoted to the position of State District Health Officer in the same department, with headquarters in Boston.

SHIRLEY KOPELMAN,[†] formerly of Jackson Heights, N. Y., has been appointed Executive Secretary of the Newburgh Public Health and Tuberculosis Association, Newburgh, N. Y.

ROBERT A. MACCREADY, M.D., of Williamstown, Mass., has joined the Massachusetts Department of Public Health as Epidemiologist in the Division of Communicable Diseases, with headquarters in Boston.

DR. COLIN M. MACLEOD, who has been Associate in the Rockefeller Institute for Medical Research. New York

* Fellow A.P.H.A.

† Member A.P.H.A.

City, has become Professor of Bacteriology in New York University College of Medicine and Director of the Bacteriological Laboratories.

WILLIAM J. McCONNELL, M.D.,* Assistant Medical Director of the Metropolitan Life Insurance Company, New York, has been appointed a consultant to the Division of Industrial Hygiene, National Institute of Health, Bethesda, Md. He will direct a nation-wide survey of present-day medical service facilities in industry.

NELS A. NELSON, M.D.,* Director of the Division of Genito-Infectious Diseases, Department of Public Health, Boston, Mass., has resigned to accept a teaching position at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

M. J. PLISHNER, M.P.H.,† who for four years has been with the Passaic County Tuberculosis and Health Association, Paterson, N. J., has resigned to accept the position of Public Relations Director for the Brooklyn Tuberculosis and Health Association, New York, N. Y.

WILLIAM P. SHIELDS, M.D., Providence, R. I., has been appointed Epidemiologist in the State Health Department to succeed DR. HARRY B. NEAGLE, who resigned because of ill health.

MORRIS TAYLOR, M.D., has been appointed State District Health Officer of the Massachusetts Department of Public Health, with headquarters in Pittsfield. He succeeds DR. FRANK B. CARROLL, who was recently called to military service at Camp Edwards, Mass.

RICHARD F. THOMPSON, M.D., Assistant Professor of Bacteriology at Columbia University College of Physicians & Surgeons, New York, N. Y., has resigned to become Professor of Bacteriology at the University of

Colorado School of Medicine, Denver, succeeding IVAN C. HALL, Ph.D., resigned.

JOHN B. WEST, M.D., M.P.H.,† District Health Officer of the New York City Department of Health, has resigned to become Medical Director of the Provident Hospital and Training School, Chicago, Ill. Dr. West will supervise a plan to integrate hospital and health service for a population of about 300,000 in Chicago.

JOHN D. WINEBRENNER, M.D.,† formerly of Muncie, has been appointed District Health Officer for the Indiana State Board of Health, Princeton. He succeeds DR. WALLACE E. CHILDS,† who has been assigned to active duty with the Army Medical Corps at Fort Knox.

Southern States

DEWITT STERLING ABELL, M.D.,† a member of the staff of the North Carolina State Department of Health, has been appointed Director of the Bureau of Sanitation in the Alabama State Health Department.

JAMES C. BRABHAM, M.D.,† of Walterboro, S. C., Health Officer of Colleton County, has been appointed Health Officer of Laurens and Union Counties, succeeding DR. HENRY R. PERKINS,† of Laurens.

WILLIAM A. DODSON, JR., M.D., of Double Springs, Ala., has resigned as Health Officer of Winston County to take a position with the U. S. Public Health Service.

WILLIAM J. DONALD, M.D., of Brewton, Ala., has been appointed an Associate in County Organization in the State Department of Health, Montgomery.

H. R. DUPUY, M.D.,† formerly of Oakland, Md., has been appointed Health Officer for Berkeley County, W. Va., with headquarters in Martinsburg.

* Fellow A.P.H.A.

† Member A.P.H.A.

LEN D. HAGAMAN, M.D., of Boone, N. C., has been appointed Health Officer of Caldwell and Burke Counties to succeed DR. WESLEY G. BYERLY, Lenoir, who resigned because of ill health.

EVERETT W. RYAN, M.D., of Charleston, Miss., has succeeded DR. DANIEL J. WILLIAMS, Gulfport, as Health Officer of Tallahatchie County.

Western States

THOMAS W. COLLINSON, M.D., has been appointed Health Officer of Scobey, Mont.

GEORGE M. UHL, M.D.,† of San Francisco, formerly on the staff of the California State Department of

Health, has been appointed City Health Officer of Los Angeles, to succeed the late DR. GEORGE PARRISH.*

DEATH

MICHAEL E. CONNER, M.D., of New Orleans, La., who worked with GENERAL WILLIAM GORGAS in ridding Panama of yellow fever, died after a short illness. Dr. Conner served 10 years in Panama and later was sent to Ecuador by the Rockefeller Foundation to do yellow fever research, receiving a special decoration from the Ecuadorian Government for his work.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

Academy of Ophthalmology and Otolaryngology—46th Annual Meeting. Palmer House, Chicago, Ill. October 19-23.

American Association of Public Health Dentists. Annual Meeting. Lamar Hotel, Houston, Tex. October 26-28.

American College of Surgeons. Hotel Statler, Boston, Mass. November 3-7.

American Dental Association—Xi Psi Phi Fraternity, Annual Reunion, Rice Hotel, Houston, Tex. October 27.

Forsyth Alumni Association, Annual Dinner, Rice Hotel, Houston, Tex. October 28.

American Dietetic Association—24th Annual Convention. Hotel Jefferson, St. Louis, Mo. October 20-23.

American Library Association — Midwinter Conference. Chicago, Ill. December 28-31.

American Public Health Association—70th Annual Meeting. Convention Hall, Atlantic City, N. J. October 14-17.

American Society of Civil Engineers—Fall Meeting. Chicago, Ill. October 15-17.

American Water Works Association—Wisconsin Section—Hotel Racine, Racine, Wis. October 6-8.

Minnesota Section—Nicollet Hotel, Minneapolis, Minn. October 9-11.

Southwest Section — Hotel Texas, Fort Worth, Tex. October 13-16.

New Jersey Section—Madison Hotel, Atlantic City, N. J. October 16-18.

Missouri Valley Section—Montrose Hotel, Cedar Rapids, Iowa. October 20-22.

California Section—Fresno Hotel, Fresno, Calif. October 22-25.

Kentucky-Tennessee Section—Hotel Andrew Jackson, Nashville, Tenn. October 27-29.

Virginia Section—Hotel Roanoke, Roanoke, Va., October 30-31.

West Virginia Section — Hotel Morgan, Morgantown, W. Va. October 30-November 1.

North Carolina Section—Sheraton Hotel, High Point, N. C. November 3-5.

Four States Section—Lord Baltimore Hotel, Baltimore, Md. November 6-7.

Florida Section—Osceola Hotel, Daytona Beach, Fla. November 13-15.

Association of Military Surgeons of the United States. Brown Hotel, Louisville, Ky. October 29-November 1.

Child Study Association of America. Hotel Commodore, New York, N. Y. November 14-15.

Colorado Public Health Association. La Junta, Colo. November 7-8.

Dairy Industries Exposition. Concurrent with annual convention of the International Association of Milk Dealers, and the International Association of Ice Cream Manufacturers. Automotive Building, Canadian National Exhibition. October 20-25.

Federation of Sewage Works Association. New York, N. Y. October 9-11.

Florida Public Health Association. Orlando, Fla. December 4-6.

Idaho Public Health Association. Lewiston, Ida. October 6-7.

International Association of Milk Sanitarians, Inc.—Annual Meeting. Mayo Hotel, Tulsa, Okla. October 27-29.

Michigan Public Health Association. Grand Rapids, Mich. November 12-14.

National Municipal League — 47th Annual Conference. St. Louis, Mo. November 17, 18, and 19.

National Safety Council. Chicago, Ill. October 6-10.

National Society for the Prevention of Blindness. New York, N. Y. December 4-6.

New Jersey Health and Sanitary Association, Inc.—Annual Meeting. Dinner at Chelsea Hotel, Atlantic City, N. J., October 13. All-day conference at the Stacy-Trent Hotel, Trenton, N. J., December 5.

New Mexico Public Health Association. Gallup, N. M. October 30-November 1.

New York State Association of Public Health Laboratories — Mid-year Meeting. State Laboratory, Albany, N. Y. November 7.

Texas Public Health Association. Corpus Christie, Tex. November 3-5.

West Virginia Public Health Association. Charleston, W. Va. November 17-19.

Foreign

Pan American Medical Association—8th Congress. Buenos Aires, Argentina. 1941.

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A City Health Officer Looks at Public Health*

JOHN L. RICE, M.D., F.A.P.H.A.

Commissioner of Health of New York City; President-Elect of the American Public Health Association, New York, N. Y.

IN 1873 the American Public Health Association held its first scientific meeting. Since that year our Association has been a guiding force in modern public health progress. The program of the A.P.H.A. is based on the advancement of public health knowledge. Our public health practices are conceived as educational measures and compulsion is restricted to a minimum. Such a program can develop only in countries where thought is free and a spirit of humanity prevails. Our public health point of view is fundamentally the same as that of our friends in the rest of the Western Hemisphere, in Great Britain, and in the other free countries.

When our Association was founded epidemics of smallpox, cholera, yellow fever, typhus and typhoid occurred with distressing frequency and were our major concern. These problems have receded into the background, but the danger from epidemic diseases is greatly

increased during times of disaster. Hence, while there should be no relaxing in our control measures against these and other communicable diseases, we must in addition concern ourselves with problems of a different sort.

It has been 14 years since a city health officer has had the honor of delivering a presidential address before the A.P.H.A. For 24 years I have worked full-time in our chosen field and for 20 of those years it has been my privilege to be on the firing line of a city, county, or state health department. From this background I have been privileged to see the forward march of public health.

I have seen something of the earnestness, enthusiasm, and productiveness of many public health workers—health inspectors, laboratory assistants, nurses, and health officers, these last working sometimes alone in their communities.

I know something of the miracles of public health, such as the substantial elimination in many communities of diphtheria and typhoid fever, the striking reduction of tuberculosis and infant

* Presidential Address delivered before the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

mortality, the vigorous and fruitful attacks on malaria and hookworm disease, the cleaning up of water and milk supplies, the building of effective sewage disposal plants, the change from the mere custodial care of records of births and deaths to the statistical use of these as direction finders. Epidemiology has replaced magic, and public health nursing has come of age. Schools of public health have produced trained workers to reinforce and stimulate those already in the field. We can all take pride in these accomplishments.

But we cannot live in the past. We are now passing through desperately serious times. Great issues of human destiny are at stake. We cannot face these conditions complacently. Now, more than ever before, public health workers must assume new responsibilities and be ready to adapt themselves quickly to what may lie ahead.

National defense dominates this country's thinking, talking, and action at this particular period in our history. For the next few years it is essential that everyone be employed in some productive task to supply the needs for defense purposes. This can be done only if we have a nation composed of physically and mentally strong individuals. Last week the President of the United States quoted General Hershey, the director of the selective service system, to the effect that nearly 50 per cent of 2,000,000 examined for selective service were found unfit mentally or physically. Action is being taken by the federal government to rehabilitate some of these men. In addition to this immediate program, President Roosevelt said that he would start a long-range program calling for coöperation of the states, cities, and counties, townships and individuals to remedy the underlying causes of the situation. Public health workers are anxious and eager to participate in an effective job of health conservation. Public health is closely interrelated with

the rest of the nation's activities. As Mayor LaGuardia, the National Director of the Office of Civilian Defense, has stated:

While we cannot escape new responsibilities and new problems in an emergency, the federal government has made it very clear that there shall be no step backward and no losing of any of the ground that has been gained in public health and economic security and social welfare. Therefore, the government itself, in its normal public health work, will continue, if not increase, its efforts, and the same is applicable, of course, to state and local health departments.

Recent events have presented us with a new problem in connection with community health protection. I refer to the matter of priorities. When a water main in a building breaks, when a sewer line in an apartment has to be replaced, when the heating apparatus breaks down, when any of these or other related accidents occur it is vital that repair and replacement materials be promptly available. Health laboratories have certain items that are indispensable for water analysis and for the detection of disease.

While concessions will have to be made regarding substitute material, items of first importance for the protection of a community's health should go to the top of the list of essential needs. The A.P.H.A. should give its support in this situation. I am not referring here to materials for construction of new health buildings which are not in the same category.

National defense is a powerful additional reason for intensifying and extending our public health program and for rigorous self-analysis of our work. Let us then turn critic and put our public health program under the microscope, not to make it look larger than it is, but to see more clearly its weak points. Let us deal with the main phases of our public health program, namely:

1. Some of the *responsibilities* of

official public health agencies in the light of present conditions and present-day knowledge.

2. The need for curtailment of non-essential activities.

3. The importance of sound business administration in our health department work.

1. RESPONSIBILITIES AND OPPORTUNITIES

In considering the *health department's specific responsibilities and opportunities*, the following three possibilities present themselves:

a. We can continue within the narrow confines that have been set by the customs of the past.

b. We can override all boundaries and take the stand that almost every human activity is related to health and set our stakes on the far flung horizon.

c. We can expand our program into those *newer* fields where health returns can be expected in abundant measure and also increase the emphasis on promising activities to which in the past we have given and are still giving not much more than lip service.

This last course would seem to me to be the wisest one to follow.

Here are some of the items:

Tuberculosis control for over 30 years has had our wholehearted attention, but the fight is not over. The time has arrived when our plans must be directed not only for the "control" of tuberculosis but for its eradication. In many parts of the country diphtheria has practically disappeared. It is possible to get the same results with tuberculosis.

Real progress has been made in the field of syphilis and pneumonia control, but we must continue to increase our efforts. Wherever intensive syphilis and pneumonia control activities are carried on, the results prove significant and effective.

The aging of the population, the marked reduction in the more serious communicable diseases of childhood, and the advances in medical and sanitary science, have had an enormous influence

on the character of present-day health problems.

Today about 7 per cent of our population are 65 years of age or over. It is estimated that by 1980 more than 14 per cent of our population will be in this older age group. Hence there is a steady increase in the prevalence of diseases peculiar to later life, such as cancer, heart and arterial disease. Most of these diseases still baffle science, both as to prevention and as to cure. The greatest present need is for an increase of research facilities and efforts in this field.

The funds of philanthropic agencies concerned with the advancement of knowledge are diminishing. It is therefore necessary for official agencies to recognize that they have to assume greater responsibility in public health research. The federal government through the U. S. Public Health Service has assumed leadership in research work in various fields including cancer. For the first time, this year the government of the City of New York has appropriated substantial funds, not only for putting its public health research work on a solid foundation, but also in order to assume a greater responsibility for it in the future.

Of the diseases of later life, diabetes is definitely controllable, and official agencies should make available insulin and treatment to those unable to secure them otherwise.

If one looks at the list of major causes of death from the standpoint of presently available knowledge as to prevention, accidents stand out above all the rest, not only because of their numbers but also because of the toll they take among the young and those in the most productive years of life. In August of this year the President of the United States called upon the National Safety Council to mobilize its nation-wide resources for an intensive safety educational campaign. The American Red

Cross, police departments, and other agencies have taken a hand in this work, but health departments must also play an important rôle in this field. If we in health departments support the work on accident prevention with the same enthusiasm and determination that we brought to diphtheria prevention, we should and can get comparable returns in lives saved.

Along with a renewed interest in accident prevention and control should go active leadership and extensive participation in training for first aid and for home care of the sick.

The high school boy gets returns from his work in algebra, but I would hazard a guess that some of this time devoted to training in first aid would on the whole fit him better to add to human well-being and happiness. The high school girl gets some intellectual growth from her years' work in French, but I venture to suggest that the same time devoted to a course in the home care of the sick might well make her a more useful citizen and mother. These are items coming within the province of departments of education, but health departments should take the initiative in seeing to it that they receive the proper attention.

The importance of nutrition is being forcibly brought home to us in connection with national defense. It is now recognized as a necessity for the soldier, the sailor, and the airman. If it is a good investment for them, why should it not be equally so for all the people?

The prerequisite for good nutrition is a society in which every individual can have sufficient food. But science has also well demonstrated that access to ample food is not enough. The kinds of food that people consume is also equally important. If the food supply is inadequate in amount an added reason is presented for the utilization of the proper kinds of food. This is especially true in view of the fact that we may

have to curtail the consumption of certain foods in order to supply our friends abroad.

It is now well recognized that, in spite of our total food supply, the number of persons who are inadequately nourished is very much larger than it need be. Here is a great opportunity for health departments to expand their programs. But in tackling nutrition, we should remember that, however important, it is not a hobby on which to take a ride, nor a solution of all of life's problems. Let us be guided by common sense and demonstrated facts, and a sense of proportion.

Slowly we are beginning to realize the relationship between good housing and health. Other agencies have taken the leadership in slum clearance and in the provision of good housing. It is not too late even now, because of the magnitude of the undertaking and the need from the health point of view, for health departments to concern themselves much more actively with this subject.

Mental hygiene, while a most complex problem, from which many of us shy, offers health departments further opportunities.

Few health departments have taken an active part in industrial hygiene. Yet this is a fertile field, especially now in connection with defense industries and the training of new workers.

For years health departments have embodied dental hygiene in their programs. I hazard the guess that no official health agency would claim that it has more than scratched the surface in this field. Before we can expect to get our dental programs on a basis where far reaching results can be anticipated, extensive and intensive scientific research is needed.

2. CURTAILMENT OF NONESSENTIAL ACTIVITIES

Turning now to the curtailment of

nonessential activities, let me give a few specific examples of activities which fail to yield returns. For years health departments have devoted a substantial amount of energy and money to the so-called control of measles. I know of no authentic evidence to indicate that there has been any real control of the spread of this disease. Almost every individual of 16, at least in urban areas, has had measles in spite of our efforts. And yet for years we in New York City, as well as other communities, excluded from school the family contacts to cases of measles. The New York City Board of Health has recently authorized the discontinuance of such exclusions, and the adoption of this change it is estimated will add \$300,000 a year to the funds of the Board of Education in state allowances based on attendance.

We are perhaps afraid to unteach the people what we have taught them for many years. True, something can be done to prevent *deaths* from measles in infants and preschool children. Here is the area to which our work may well be limited until science brings us new weapons for general control.

The public believes, and I am afraid we have led them to believe, that we have considerable power in the control of influenza and poliomyelitis, when as a matter of fact the procedures that we now employ for these two diseases are of *no* demonstrated value. In German measles and chicken pox far too much ineffective energy is being wasted for fear the public will interpret our lack of action as wilful neglect rather than lack of scientific knowledge.

In the case of whooping cough, more facts are needed before we can serve a very helpful purpose.

Our programs of milk control need looking into. Probably too much effort is being placed on inspection of dairy farms and too little on the collection stations and on the pasteurizing plants. In many communities we have reached

a point where the quality of the milk supply is such that the health department no longer needs to spend its time in setting and enforcing standards for different grades. Rather, the health department should spend its time in making sure that *all* milk offered for sale is *safe*.

If further reductions are to be expected in infant mortality we should deal much more effectively with the health problems of the expectant mother, her delivery, and the premature infant.

Health education is now in the forefront of our program. But in order really to modify human conduct in matters of public health we must make more use of the rifle than of the shotgun. The quality of our leaflets and annual reports is improving. But on the whole a great deal of our "literature" is still poorly distributed, many of our radio broadcasts still fall on dead air, and our lectures reach comparatively few. Not only more money, but more thought needs to be devoted to *quality* of work.

The public health nurse is one of our great educators and we must have more. But we have neglected to make available to her one of her greatest opportunities for effective education. If bedside nursing were a part of her work in the health department, she could do a more telling educational job as well as render a greater service. I realize, of course, that this may not prove simple in practice. But it is one of the problems which should receive our most careful consideration.

The physician is potentially the greatest of health teachers. The health department is not competing with him; it is working with him for family health conservation. Thousands of family physicians are doing a bang-up good job in personal health education. But how much are we in health departments actually doing to assist the doctors in their health educational work?

I agree with those investigators who state that much of our medical service for school children has failed to yield adequate returns. The sooner we can develop a common understanding and a clear allocation of responsibilities as between the school teacher, the nurse, the school doctor, and private physician, the better the results will be.

The health department should not only accept *community leadership* in public health but it should *insist* on having it. This cannot be done if the official agency is weak and the non-official agencies are strong. The health department on the other hand can only maintain its leadership if it recognizes that the rôle of the voluntary agencies should be to supplement and support the official health agency.

Let us evaluate rigorously present activities and eliminate nonessentials and those that are not yielding results from the public health point of view, regardless of old customs or precedents.

3. SOUND BUSINESS ADMINISTRATION

And now to the third point, namely, the importance of sound business administration. The time has passed when a health department riddled with political and commercial pressure, manned by vote-getting but untrained workers, can hold public confidence. The American people know, understand, and demand health guidance and protection. They ask that their health department be free to go forward without political interference either as to its personnel or its activities. You know, and I know from my own experience in New York City during the past seven and a half years, that an honest city, state, or county health administration backed by an awakened public can make sure that the health department and politics part company. If this can be done in as large a city as New York, it can be done anywhere.

The health department should not be

housed and equipped as the stepchild of municipal government. Housing facilities and equipment should be at least on a par with other governmental departments. Adequate funds and facilities should be made available in recognition and encouragement of work that is done efficiently, economically, and fruitfully.

The grants-in-aid to states and cities from the federal government have effectively aided our work. It is our job to see that such funds are used wisely and economically.

The sins against sound business administration cannot be covered by the cloak of scientific acumen. Effective business practice is as important in scientific health work as in any other administrative work.

Personnel should not only be qualified for the various tasks but steady and adequate production should be insisted upon to merit tenure and security.

The application of a merit system for public health workers, in which the A.P.H.A. is playing an important rôle, makes for better service and better returns on the money invested.

However, it is not enough to employ trained workers and assign them to tasks for which they have special aptitudes. Neither is it sufficient to see to it that a full day's work is done. The health department should have a personnel training program to keep the staff up-to-date. Public health science is constantly changing and improving in facts and technic.

To sum up, health departments must assume leadership and responsibility for a broader field of public health. Our job should be something more than preventing disease and reducing death rates. Good health, not mere survival, is of the greatest importance to mankind. Happy and wholesome living should be our goal. The success of our activities for the attainment of a maximum of health for the people will depend upon

wise planning, efficient operation, and constant employment of practical measures.

There cannot be and there must not be any blackout in public health either now or in the future. Despite wars and threats of social chaos, our modern

public health campaign for better, healthier, and more civilized lives will go forward if we all work and fight for it. The American Public Health Association, I am sure, will be in the future, as it has been in the past, a most powerful factor in this fight.



MEMBERSHIP ROLL CALL—NOVEMBER 11-30, 1941

Protection of Children in Great Britain in Wartime*

MARTHA M. ELIOT, M.D., F.A.P.H.A.

Associate Chief, Children's Bureau, U. S. Department of Labor, Washington, D. C.

PLANS for wartime protection of children in Great Britain were started at least 2 years before the declaration of war. The preparation of plans for the evacuation of children from areas of danger was begun 16 months before war was declared. Throughout this long period of planning and during the 2 years of war which have followed, there has been progressive improvement in every phase of the work—health, welfare, education, and recreation—whether in the bombed cities or in the relatively safe areas to which evacuated children have been sent. National responsibility for protecting children was shared by the Ministries of Home Security and Health and the Board of Education. The doing of the job fell to the local authorities.

When the Mission on Civil Defense visited Great Britain in February, 1941, war had been under way for a year and a half and London and other cities had experienced 6 months of bombing. By this time it had become clear to almost everyone that life in a great city under bombing was no place for children. Actually more than 80 per cent of all London children had been evacuated and were being taken care of outside

the city in many hundred towns and villages. The latest report from the Ministry of Health in London indicates that in August, 1941, in spite of 3 months of quiet, only 170,000 children, out of a normal total of about 700,000, remained in the city.

IN CITIES UNDER BOMBING

For the protection of those children who were still left in London certain steps had been taken. School buildings had been provided with shelters, and respirators had been distributed to children. Communal feeding centers had been established in 139 places in London where families or groups of school children could go for one good meal a day or from which cooked food could be taken home. Emergency rest centers for families who had been bombed out in the night had been established in every part of the city. Here hot drinks and food were available, cots were provided, and nurses and welfare workers to give immediate help. In strategic places in the city information centers had been organized where advice could be given to bombed-out families as to what to do next.

In February, 1941, bombing was relatively light and only about one-sixth of the population were seeking protection at night in the public shelters. In spite of improvements

* Read at a Special Session on Civilian Defense in an Emergency of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

in sanitation and equipment, the attendance of nurse and physician, and the provision of hot soup or cocoa from the canteen, shelter life was at best an unwholesome and wholly unfortunate experience for children and young people. Many of the shelters were damp and cold; the opportunity for the spread of infection was great. Life in the shelters was one of the most potent arguments for a policy of evacuation of children from any area where to be physically safe people feel they must seek refuge underground.

In February, 1941, the usual school medical services and child welfare clinics were in operation in London, though somewhat curtailed in extent. At the outbreak of war in September, 1939, all school and child health clinics had been closed, and school physicians and nurses and all health visitors responsible for maternity and child health services had been automatically relieved of their regular duties and been assigned to the Emergency Medical Services for duty in first aid and other casualty stations. When no casualties and no bombing occurred this transfer of school health personnel was quickly acknowledged to have been a mistake, as was indeed the closing of schools. The need for the regular medical services for children about to be evacuated was most urgent. Almost at once doctors and nurses were recalled from the Emergency Medical Services, school treatment clinics were reopened, and thorough medical and nursing service and follow-up care were offered to all children who remained in the city and were required for those who were being made ready for evacuation.

A round of visits with one of the school medical officers in London to a school where regular medical check-up examinations were being given by doctor and nurse, to a school treatment clinic where minor ailments of all kinds were being looked after, to a special

examination center for children about to be evacuated, left no doubt that every effort was being made to give as good care as was possible under the circumstances. To provide satisfactorily for young children seemed more difficult because health visitors had been transferred to the first aid units of the Emergency Medical Services. Child health clinics had been opened, however, in February, 1941, though in some cases in first-aid stations, and health visitors were being released increasingly to return to their usual work with children and maternity patients or to go out of London to help with evacuated children. As in the case of the school medical personnel, there was general agreement that these health visitors should never have been released from their work with children.

Planning for maternity care was the responsibility of the regular maternal and child welfare authorities under the supervision and standards of the Ministry of Health. The Emergency Medical Service provided for emergency hospital care in the cities. The plan provided that normal obstetric patients were to be delivered at home under the domiciliary midwife services or sent to maternity homes established as war measures outside the larger cities under the maternal and child welfare authorities.

During the first year of the war when there was no bombing, relatively few women left the large cities for delivery care and the domiciliary midwife service in the city was greatly overtaxed. When bombing started, however, in September, 1940, the proportion of women seeking care outside London increased very rapidly, until in the last weeks of 1940 only about one-quarter of the usual number of deliveries took place in London.

The success of this maternity care plan is not questioned. In February, 1941, 90 maternity homes were in

operation and 30 more were in reserve. They were nearly all in large country houses equipped well and staffed by physicians and trained midwives to give the best type of care. Women in the last month of pregnancy were sent to neighboring towns to wait either in a prenatal hostel or in a private household. After delivery they returned to the private household or went to another hostel. The large medical and midwife schools have coöperated in this plan and contribute much to its success.

Under the Emergency Medical Services medical care of sick children is provided for emergency cases in the city hospitals, for other cases in hospitals outside the city. Out patient clinics for children in cities under bombing usually remain open. Pediatricians, though enlisted in the Emergency Medical Services for emergency work, give their usual service in children's hospitals and clinics.

The need for increase in the number of child guidance clinics, both in areas under bombing and outside in the towns and counties that are crowded with evacuated children, is very great. Mental hygiene work for children, though recently expanded somewhat, is still far from adequate to meet present needs. To combat the trend toward an increase in delinquency among older children and young people, recreational activities, clubs, and service organizations are being developed extensively. There is a continuing need to help these youngsters overcome the sense of insecurity, the restlessness and the urge for activity, the feeling of freedom from restraint and convention that comes during a "blitz" and results in petty stealing or moral delinquency or other deviations from society's accepted code of behavior. There is no more important social activity for children and young people who must stay in the bombed areas.

THE EVACUATION OF CHILDREN

The task which the British Government set for itself when it undertook to plan and carry out an evacuation of children and mothers from London and other areas of danger proved to be more difficult than was anticipated, and the 16 month period of preparation was none too long to take the necessary steps. By the time war was declared in September, 1939, and the evacuation ordered, registration of children and plans for assembly in London had been completed, transportation schedules for trains and buses were ready, plans for the reception of children in the provinces had been made. The move itself went off like clockwork. In less than 4 days more than 600,000 children and mothers were moved from London and a similar number from other cities. Not a child was lost. Practically all this great multitude of children were taken into private households; a few were placed in school camps, hostels, residential nurseries. All Great Britain had become one great child-placing agency.

The story of what happened next and the return of thousands to London and other cities is only too well known. Most difficult situations were created when a mother and young children from the tenements of London or other industrial cities were lodged with a country family and expected to use the kitchen stove and pots and pans and other household equipment that belonged to the host. At the beginning few people in the reception areas realized that special preparations would have to be made for the absorption of these city mothers and children into the life of the community. Many communities did provide a midday meal for evacuees in conjunction with the school lunch; in some, recreation centers for school children were at once available. All too often, however, mothers with little children from the big cities did not feel at home. They missed the

shops, the "pictures," the excitement of the city. They were not used to the quiet of the country. Their husbands and older children and friends were all back in the city. The school children, too, were homesick and missed the city streets; school was irregular at first; adequate school quarters were hard to find; playgrounds were scarce. Many older boys and girls committed a variety of minor delinquencies largely as a reaction to the insecurity they felt at being uprooted from their homes and the lack of opportunity to "let off steam" in their customary activities. Add to this the absence of any bombing during the early months of the war and the unexpected decision by the Government to collect part of the cost of care from parents or husbands, and the stage was set for the great trek back to the cities. Most of this reaction was not foreseen. Had it been, preparations to meet it could have been made before it happened instead of afterward.

When the British evacuation of children is mentioned here in the United States this is the picture that comes to most people's minds. Somehow the story of the ultimate success of the plan has never been adequately told over here. Few seem to realize that though thousands went back to the cities, especially the mothers with little children, other thousands stayed out in the reception areas, particularly children of school age who had been sent out in school groups under the personal supervision of their teachers. Actually, 4 months after the first evacuation took place there were still more than 400,000 school children in the reception areas. Nearly all these children were living in private families. Any child-placing agency in this country would look upon the care of such a group of children as a Herculean task.

Following the first great evacuation no more mass evacuations were under-

taken until after the fall of the low countries in May, 1940; there was, however, a day-by-day movement of small numbers of school children known as the "trickle evacuation," and an ebb and flow between the cities and the reception areas.

It was indeed fortunate that, in the absence of bombing, the authorities had a respite from the difficulties of these first few weeks to give them a chance to work out more satisfactory arrangements before the next wave of evacuees began to move. Until local reception authorities in the counties and towns were actually faced with the task of absorbing into their communities literally hundreds of school children or dozens of families of mothers and young children, they did not realize how hard this task would be. Until the evacuation authorities in cities began to hear the complaints about the condition of the evacuees, they did not realize what a mistake they had made in disbanding the maternal and child health and the school medical and treatment services. Once the need for more extensive preparation was known, it did not take long to proceed to meet it.

In the evacuation areas immediate steps were taken to install a complete system of medical examinations and treatment of minor ailments, with nursing inspections and follow-up, to which reference has already been made. Plans were made also to send out with the evacuees any information already known to the authorities as to the habits and behavior problems of the children.

In the reception areas plans were laid by local authorities with the financial help and advice of the Ministry of Health and the Board of Education to develop a more effective "scheme" for the absorption of evacuated mothers and children into the life of the community. The job was essentially one of community organiza-

tion, involving health, welfare, education, and recreation. Though the responsibility for this job was placed on the local public authorities, women volunteer workers carried most of the day-by-day work. Moreover, with nearly complete responsibility for the planning and execution of programs of work placed in the hands of hundreds of local authorities and only approving powers in the central authorities, it was natural that services for evacuees in different communities would vary greatly in their effectiveness and quality. To have established in a short time a more uniform level of care of children would have required more authority in the central government and a larger staff of trained welfare workers than existed.

As the crisis of September, 1940, approached and the bombing of London and other cities brought about a new and incessant flow of children from the cities, increased advice and assistance was given to local authorities by the Ministry of Health and the Board of Education. Recommendations were made respecting the establishment of community social centers for mothers, community laundries and sewing rooms, recreational activities for school children and youth, nursery centers for young children accompanied by their mothers, residential nurseries for young children sent out without their mothers, maternity homes and homes for the temporary care of children awaiting placement or more permanent care of children difficult to place in private households. Pamphlets on schools in reception areas, on nursery centers, on school meals and communal feeding, on informational service were issued. Local authorities were urged to work out effective methods of supervision of children placed in private homes and to find dwellings where one or more families could live by themselves in their own quarters—not billeted on another family. In addition,

school nurses, school physicians, midwives, and health visitors were transferred to the extent possible from evacuation to reception areas. Both central and local authorities were handicapped by a shortage of social workers trained in child-placement methods. Volunteers entered into the work with tireless enthusiasm. Without the great army of women volunteers this program of care for evacuated children could not have been carried forward to success.

The appointment of social workers, recruited from among the child-care workers serving the London school system, first to regional and local health authority staffs, and finally to the Ministry of Health central staff has helped very greatly in community organization for the supervision and care of children and has contributed immeasurably to the absorption of evacuees by the reception areas.

As we review today the whole development of the wartime program of care for children and attempt to analyze the elements in it that have contributed to its success, one factor stands out as important above others, namely, the outstanding, nation-wide program for maternity care and child health that had been developed long before the war began. Ever since 1908, when the first school medical program was started, and 1918, when the maternity and child welfare plans were put into operation, extraordinary advances had been made. Public confidence in the Government's program was great. Child health clinics, prenatal clinics, school medical service and treatment clinics, district nurses, health visitors, and trained midwives were serving the people of practically every borough and town and village. A school lunch program had been developed by about 60 per cent of all local school authorities, with free lunches as needed by about 50 per cent. All this meant that in 1938, when war

appeared to be imminent, the people planning for the protection of children could count on the presence of at least some competent professional health personnel to help with the work in practically every community.

Without this backlog of maternity care and child health service, the British authorities could not have carried out as successfully as they did the program of child care and protection which has been found essential under war conditions. The periods of heavy bombing have sometimes strained these services almost to the breaking point. In cities under bombing well organized services have been difficult to maintain. In the rural areas, child health and school medical services have been taxed too heavily by the sudden arrival of huge numbers of children, and the quality of service to mothers and children has sometimes suffered. But with all the vicissitudes of war, the program continues to function and children and mothers are cared for.

There is much in all this story of how the people of Great Britain have worked out their plans for the protection of children in wartime which could be used by us in this country even today. Our problem is not one of bombing or war. But we do have today large movements of population, even occasionally an evacuation of a small town to give way to some military establishment or industrial plant; we have great numbers of families migrating from place to place in search of work; mushroom towns and cities are growing up suddenly out of tiny communities which to start with were ill equipped to meet even their own child health and child welfare needs. Where originally a population of 1,000 was poorly provided for, today 10,000 may exist with little or no increase in public health nurses, child health or prenatal clinics, hospital care for maternity patients or sick children. In industrial

areas we now have problems of thousands of mothers going into the factories, thousands of families living under congested and bad housing conditions. The experience of Great Britain in organizing communities for the great migration of evacuated mothers and children, for care of children of working mothers, is worthy of our close study and adaptation to our own needs.

Many people in this country are still unaware of the fact that we have today no such universal backlog of maternity care and child health services as did Great Britain at the beginning of the war. In only 22 per cent of our rural counties have public authorities made regular child health conferences available to the people; in only 18 per cent prenatal clinics. Even in many full-time county health units the situation is far from satisfactory, for in only 43 per cent is there a child health conference under the health department, in only 39 per cent, a prenatal clinic. Twenty-five per cent of small cities (from 10,000 to 25,000 population) have no child health conference either public or private, 47 per cent no prenatal clinic. At last count there were still 850 counties with no public health nurse serving the rural population. Only about 2 per cent of the cities of less than 10,000 population have an outpatient clinic to which sick children can be referred. School medical services are generally inadequate, especially in respect to correction of remediable conditions.

If we should be faced suddenly with more serious defense situations than exist today and were forced to provide special protective services for children in cities or other areas of potential danger, or to evacuate children and mothers from certain areas because of actual danger, we should be confronted with a task for which we are ill prepared. The deficiencies in child health and welfare services in the smaller

towns and cities would suddenly become highlighted because these are the communities to which many children from the larger cities would be sent. Though there is, perhaps, little reason to believe that any such movement of children as that Great Britain has experienced would ever be necessary in this country, there is every reason why we should put our child health house in better order in all these communities and have ready the blueprints of a plan for emergency action in case it ever should be needed.

With this in mind a small interdepartmental committee on health and welfare aspects of civilian evacuation was recently appointed jointly by the Directors of the Office of Civilian Defense and the Office of Defense Health and Welfare Services. This committee, representing the Bureau of Public Assistance of the Social Security Board, the Public Health Service, the Office of Education, and the Children's Bureau,

has been instructed by the appointing officers to study the problem and report on suitable plans of procedure.

Experience with current defense problems has made clear the health and welfare hazards to children that accompany the migrations of large numbers of people. These hazards would be far greater in the case of an evacuation of any considerable number of children and mothers resulting from military action unless careful plans had been made in advance and the supplemental facilities and services that would be essential to meet the needs of evacuated persons in reception areas had been provided. Fortunately in any preparations that are made today for defense no steps need be taken that will not contribute to the health and welfare of children in normal times, no step need be wasted effort, even though at the moment directed toward defense rather than toward normal orderly progress in the child health program.

Study of Home Accidents: Their Public Health Significance

DONALD B. ARMSTRONG, M.D., Sc.D., F.A.P.H.A., AND
W. GRAHAM COLE

Third Vice-President, and Director of Safety, Metropolitan Life Insurance Company, New York, N. Y.

WHAT is known about the character, frequency, cost, and prevention of home accidents—their where, how, and why, so to speak? What constitutes the responsibility as well as the opportunity of the department of health in this field?

The main body of this paper (and the chief reason for its preparation) is a summary now available of a special analysis of home accidents as studied and reported upon by a visiting bedside nursing service—the salaried service staff of the Metropolitan Life Insurance Company. This study extended over a 12 month period, from April, 1940, to April, 1941. The results are interesting, and throw some light on the "epidemiology," so to speak, of home accidents; they also indicate ways in which the visiting nurse can participate constructively in home education aimed at the prevention of accidents and their costly sequelae.

As a background of this current study, a brief reference will be made to certain other recent inquiries, stressing their principal points of emphasis, comparing past findings with current ones, and pointing out where the present Metropolitan study differs from other studies in its findings, as well as where it presents items not hitherto disclosed.

THE HEALTH DEPARTMENT AND THE ACCIDENT PROBLEM

Before presenting these details, let us turn our attention for the moment to the second question asked at the start—what is the health department's part in the home accident problem? Many health departments fortunately seem disposed to take an increasing interest in the entire accident problem, as is also true of public health nursing groups. As a whole, accidents constitute a very big factor in our national experience, with a major element of preventability. In the United States, in 1940, accident fatalities were distributed as regards major units as follows:

	<i>Accident Fatalities</i>
Home Accidents	33,000
Traffic Accidents *	34,500
Public (not traffic) accidents	15,900
Industrial Accidents *	17,000
<hr/>	
Total (* eliminating duplication of 2,900 deaths)	97,500

Also, in 1940, among the 17 million industrial policy holders in the Metropolitan Life Insurance Company, the death rate for all accidents combined was 46.7 per 100,000, ranking sixth among the leading causes of death, and preceded only by heart disease, cancer,

cerebral hemorrhage, chronic nephritis, and coronary disease with angina pectoris. As a cause of death accidents run ahead of tuberculosis, pneumonia, and diabetes. In 1940 the death rates for all ages in the Metropolitan Industrial policy holder experience per 100,000 for different groups of accidents were:

	Rate per 100,000
1. Motor Vehicle Accidents	18.1
2. Occupational Accidents	6.2
3. Home Accidents	11.7
4. Other	11.9

As to automobile and street accidents, some health departments are continually increasing their coöperative activities with police departments and private agencies. In industry as well, we seem to be on the verge of a much greater degree of activity by health departments, in cooperation with labor and industrial units, on a state basis at least.

THE HEALTH DEPARTMENT AND HOME ACCIDENTS

It must be recognized here that only in small part are home accidents controllable by collective means, as were certain of the major health hazards in the community in earlier years, such as those diseases curbed by a pure water supply, sewage disposal, and milk pasteurization. It is true, as regards home accidents, that there are certain basic requirements in home construction which tend to eliminate some hazards. Enforcement here usually falls to some official agency other than the health department. There is also an increasing amount of legal requirement as regards home living equipment, at least as to electrical installations, though here, too, promotion and enforcement generally are inadequate and are found in the hands of other branches of government, such as building departments and fire departments. In the home accident

field, more than in the highway and industrial fields, and more than was the case originally in the public health field in general, the major portion of the problem is a personal one, dealing with home living methods, and controllable only by proper education and motivation—at least in a democracy, where the privacy of the home is still respected. We suppose that in a totalitarian state, if the authorities can send a man to a prison camp for violating restrictions about listening to foreign broadcasts in his own home, they can probably also jail a man for falling off a rocking chair while hanging a picture. But in America today we must fortunately still depend upon education! It is also true that the health department is peculiarly fitted by tradition and experience in meeting this need. Better than other public officials, the health officer knows and practises educational technics in his promotion of personal hygiene. Health officers might be expected to demonstrate this superior ability should they increasingly share the job of controlling street accidents with police departments. In industry, they are beginning advantageously to share their skills with departments of labor. In the home, they will have as coöperating agencies those who can greatly benefit by health department participation and leadership, such as the fire department with its considerable interest in home hazards, and the voluntary safety groups, who have up to this time devoted most of their energies to street and highway problems. In preventing home accidents, the health department will certainly find not only an uncrowded field and a free range, with many wide gaps for energetic efforts, but they will also find a great opportunity for the application of the health department's peculiar personal hygiene technics—an orientation of interest and a concentration of effort that should mean much in

decreasing preventable incapacity and in promoting life conservation.

WHAT IS KNOWN ABOUT HOME ACCIDENTS

Without attempting a historical review, we shall refer to several important studies of home accidents by public health agencies in the last year or two and to a few of the more important observations in these studies.

Accidents in the Urban Home as Recorded in the National Health Survey—Rollo H. Britten, Sr. Statistician, United States Public Health Service—*Public Health Reports*, November 8, 1940.

1. Home accidents cause nearly as many deaths as diabetes, more than appendicitis, and many more than diphtheria, scarlet fever, whooping cough, and measles combined.
2. Housewives sustain one-third of all serious home accidents, and an additional one-fourth occur among children for whom housewives have the major responsibility.
3. A large proportion of home accidents occur among children and adults in the most productive ages, and many result in permanent orthopedic impairments and in blindness.
4. Accidents in urban homes, disabling for one week or more, occur at the annual frequency rate of 4.65 per 1,000 persons. Those disabling for a month or more occur at the rate of 2.52 per 1,000 persons.
5. The average duration of disability from home accidents disabling for one week or more is 49 days.
6. The annual frequency rate for females is 5.45 per 1,000, and for males 3.78 per 1,000 (in part reflecting exposure).
7. More accidents occur among persons in poor economic circumstances, the highest rate being for persons in the relief group.
8. In 64 per cent falls were the means of injury; cutting and piercing instruments in 13 per cent; burns in 8 per cent; and other means in 14 per cent.

Illness and Accidents Among Persons Living under Different Housing Conditions—Rollo H. Britten—*Public Health Reports*, March 28, 1941.

As regards accidents:

1. Frequency of home accidents increased as rental of dwelling went down, males showing a much greater rise in the home accident rate with drop in rental than was true for females.

2. Each means of injury showed higher rates in dwellings of low rental, though frequency of disability from burns rose more rapidly with falling rental than from any other means.
3. It is impossible to determine to what extent factors associated with low income play a part, such as dilapidation and faulty house design, overcrowding, poor equipment for household operations, etc.

Home Accident Fatalities—an Analysis of the Causes of Fatal Accidents in Minnesota Homes—Minnesota Department of Health.

1. During the first 6 months of 1940 accidents were responsible for the deaths of 849 Minnesota residents—40 per cent of these were home accidents.
2. The principal factors thought to be responsible were inherent carelessness, negligence of adults toward children, weather and the forces of nature, and incapacity through old age and disease.
3. About 54 per cent of the home accidents resulted from falls, but 92 per cent of those dying from falls were in the older age groups and not actively employed in any gainful occupation. Deaths due to falls are bound to increase as the population ages, paralleling the situation with reference to cancer, heart disease, and other degenerative affections.
4. Burns were responsible for nearly one-fourth of the total, and affected mainly children and young people. These accidents were very distinctly from controllable causes, such as scalding, lighting fires with kerosene, conflagrations, defective wiring, smoking in bed, etc.

Home Accidents and Their Prevention—Professor Irma G. Nevins, Kansas State Teachers College.

Tabulations from this survey, reported by Dr. F. P. Helm of Topeka, Kansas (Chairman of the Committee on Accidents of the State and Provincial Health Authorities of North America) among other things show:

1. In Kansas in 1940 there were 530 deaths among all ages from home accidents.
2. Falls accounted for approximately 60 per cent, and burns for 16 per cent—a total of 76 per cent for these two causes.
3. Sixty-six per cent of all these fatalities occurred among people 65 years of age and over.
4. Twelve per cent were among children 4 years of age or under, mainly from suffocation, burns and drowning.

Those interested will find it well

worth while to consult these reports. They contain many additional significant findings. From certain points of view we will not perhaps have picked out the most important observations. There are also other studies in recent years that may readily be consulted in appropriate library files.

THE STUDY BY NURSES: METHOD AND LIMITATION

Incomplete portions of this study have been reported earlier, in which some account was given as to the method used.^{1, 2} It may briefly be indicated that early in 1940 the Metropolitan Life Insurance Company asked its salaried nurses throughout the United States and Canada to submit reports on all cases regarding accidental injury for which nursing service was requested. As the company maintains in the United States and Canada 325 salaried nursing services employing a staff of 674 nurses who handle about 300,000 nursing cases a year, the study by this staff covers a large number of individual homes.

In launching the inquiry, letters of instruction were sent to each nurse, and additional information was furnished them through regular supervision channels. No special forms were developed for the purpose; the nurses furnished the required information on their regular case reports. They were instructed to report on each case involving care necessitated by an accidental injury; to make inquiry regarding conditions under which the injury was received and to report first whether it was the result of a motor vehicle, occupational, public, school, or home accident. In the case of home accidents, additional information was requested, including the nature of the injury, part of the body injured, action of the injured person, location and type of accident, and the objects involved.

In general, the study was confined to

accidental injuries sustained by Industrial and Intermediate policy holders, and Group certificate holders of the company. It covers cases which were of sufficient severity to require nursing service. Of the home accident cases reported 13.4 per cent were hospitalized, and 0.4 per cent were fatal.*

In summary, this survey included an average of 1,079.5 accident cases per month, or a grand total of 12,954 during the year. It is interesting to note that 49 per cent of all injuries reported, or a total of 6,315, resulted from home accidents. The National Safety Council figures show that home accidental deaths are about 36 per cent of all accidental deaths and that home injuries are about 50 per cent of the total.

THE STUDY BY NURSES: PRINCIPAL FINDINGS

The findings in this survey are assembled in several tabulations thus far completed. More combinations and analyses are possible and may be made subsequently:

I. Sex and Age—

As to sex, no special tally was made of cases recorded, it being assumed that they constituted a fair cross-section of the nursed group in general, and were similar to the figures for all nursed policy holders, which, in 1940, were 28 per cent male, and 72 per cent female. Females, and children 14 and under, represent a combined total of 90 per cent. This means, as is the case with our nursing service in general, that it is somewhat selective against the male population, when compared with the population at large, and when compared with figures cited from other more generalized home accident studies.

Based upon a 50 per cent sampling, the home accident cases were distributed by age as follows:

* Based on 10 months of the study which included 83 per cent of the total cases reported.

	<i>Per cent</i>
Under 4 years	21
5-14 years	16
15-24 "	6
25-44 "	20
45-64 "	23
65 and over	14
Total	100

It will be noted that this distribution is in marked contrast to other figures cited earlier. In the Kansas study, for instance, the accident cases 65 years of age and over constitute 66 per cent of the total, whereas in the Metropolitan experience this figure is only 14 per cent, which means that in the Metropolitan experience the chronic older cases are given only a limited service, and the aged are not insurable.

In the Kansas figures children under 4 years constitute 12 per cent of the total, whereas in the Metropolitan this figure was 21 per cent—reflecting an obviously different exposure. In the Metropolitan study, if we take children 14 years and under we have a total of 37 per cent—which influences many factors in the subsequent analysis.

II. Type of Accident—

The type of accident is indicated by the following items and percentages*:

	<i>Per cent</i>
Falls from Heights	13
Falls on Levels	33
Falling Material	2
Handling Materials or Objects	11
Stepping on Objects	6
Collisions with Objects	15
Hot or Burning Substances	13
Electric Burn or Shock	1
Inhaling Gas or Smoke	—
Poisons, Not Gas	1
Other	5
Not Specified	—

Items of special interest include:

1. Falls from Heights and Falls on Levels

* A dash (—) represents less than 0.5 per cent in this and succeeding tables.

show a combined percentage of 46 for total falls, which as usual becomes the first cause. This is not as great as in some other studies where more older people were involved, as in the Minnesota study, for instance, where the figure for falls was 54 per cent.

2. In the Metropolitan study "Collisions" takes second place—presumably accidental contacts with home equipment.

3. Burns, with 13 per cent, takes third place, as compared with 16 per cent in the Minnesota study—possibly reflecting some differences in definition.

4. It is interesting to note that Poisons accounted for only 1 per cent of the home accidents, and Inhaling Gases and Asphyxiation was also a negligible cause of home accidents. Does this mean perhaps that these two items stand out as favorable results of educational programs, which have laid great stress upon the danger of carbon monoxide poisoning, and the importance of labeling poisons and keeping them away from children? It is to be hoped so, although it cannot be proved. It may be that carbon monoxide poisoning is so often promptly fatal or immediately hospitalized as to eliminate home nursing contacts.

III. Objects Involved—

	<i>Per cent</i>
Household Furnishings or Equipment..	12
Floor Coverings	3
Slippery Surfaces	6
Toys and Play Equipment	4
Tools and Sharp Objects	14
Utensils	7
Food	3
Animals, Insects, etc.	3
Heating Equipment, etc.	5
Laundering Equipment and Materials..	5
Inflammable Liquids or Materials	2
Other Household Appliances	1
Plumbing Fixtures	—
Structural Defects	2
Firearms	1
Automobiles	1
Multiple	—
Other	14
None or Not Specified	17

1. It will be noted that Tools and Sharp Objects stand first with 14 per cent (13 per cent in the National Health Survey). From the records, as well as on a basis of general assumption, this would seem to reflect carelessness, lack of training and skill, the unsupervised use of adult instruments by children—

all representing a high degree of controllability.

2. In this breakdown, which is not entirely satisfactory, Household Furnishings and Equipment, with 12 per cent, takes second place. Some of this no doubt reflects poor construction, not easily remedied; some reflects more controllable equipment and still more controllable methods of living—subject to an educational influence.

As a matter of fact, we obtain a much more substantial factor here if we combine the figures for Household Furnishings and Equipment, Floor Coverings, Utensils, Heating Equipment, Laundering Equipment, Structural Defects and Other Household Appliances—a total of 35 per cent.

3. Two items highly controllable by education are Toys, with 4 per cent, and Inflammable Liquids with 2 per cent.

4. It is interesting to note, as was the case with Poisons and Asphyxiating Gases, that Firearms, with 1 per cent, is an insignificant factor.

IV. Location of Accident—

	Per cent
Living and Sleeping Quarters	15
Dining and Kitchen Quarters	30
Bathroom	2
Hallways, etc.	2
Cellar	3
Attic	—
Stairs or Steps	17
Porch, Yard, etc.	27
Garage	1
Other	2
Not Specified	1

1. The Dining and Kitchen Quarters comes first with 30 per cent, reflecting the leading item in table III (Tools and Sharp Objects) and the leading item in table VI, as will be seen below.

2. We find that the Porch or Yard comes second with 27 per cent, which reflects a high percentage of children, the item of "Playing" in table V, and the element of falls, as already discussed.

3. It is not surprising to find Stairs with 17 per cent. In fact, one might expect it to be higher.

4. These figures, as have others, indicate that the bathtub is a much maligned item of equipment in the household, the bathroom as a whole registering only 2 per cent.

V. The Action of the Injured—

	Per cent
Walking and Running	37
Household Cleaning	3
Laundering Duties	4
Other Household Duties	8
Cooking	5
Eating	1
Playing	24
Tending Heating Equipment	1
Other	13
None or Not Specified	4

1. First place is taken by Walking and Running with 37 per cent, and Playing is second, with 24 per cent—reflecting again a large percentage of children, and the prominence of the Porch and Yard in the preceding table.

VI. Nature of Injury—

	Per cent
Cuts, Lacerations, and Abrasions	26
Bruises and Contusions	12
Burns and Scalds	21
Strains and Sprains	11
Asphyxiations	—
Fractures and Dislocations	20
Poisoning	1
Foreign Bodies	1
Bites	2
Multiple	3
Other	3
Not Specified	—

1. We have already referred to Cuts, Lacerations and Abrasions which takes first place, with 26 per cent. This reflects the use of instruments by housewives in the kitchen, and also reflects the high percentage of women in this study.

2. Burns, with 21 per cent, takes second place, as is the case in most studies.

3. The importance of falls is implied in this table by such items as Bruises and Contusions (12 per cent), Strains and Sprains (11 per cent), and Fractures and Dislocations (20 per cent)—the latter in particular indicating the serious and incapacitating consequences of many home injuries.

VII. Part of Body Involved—

	Per cent
Hands and Fingers	16
Head, Face, and Neck	11
Legs, Feet, and Toes	32
Arms	12
Eyes	1

	(cont.)	Per cent
Trunk		16
Internal		2
Multiple		10
Not Specified		—

1. It seems likely that the high percentage (32 per cent) for Legs, Feet, and Toes has something to do with the high percentage of children, though a breakdown that would demonstrate this has not yet been carried out.

As Mr. Cole and Miss Haupt said in their paper, referred to earlier, it is possible roughly to summarize these data by presenting a composite picture or "montage" of a home accident, which would give us a description somewhat as follows:

"The victim received cuts (lacerations or abrasions) of his legs (feet or toes) as a result of a fall on a level surface against a tool (or sharp object) while he was walking (or running) in the dining or kitchen quarters (or yard)."

This of course could legitimately be modified in many ways, and for the population as a whole is no doubt a bit out of focus because of the high percentage of children and women in this inquiry.

As pointed out in discussing the older studies and in analyzing this one in particular, these data indicate that there are in the picture many factors subject to control by educational methods, whether these be through home visiting contacts, through literature and other educational devices, through schools, special classes, and other means.

The elements to be attacked include *ignorance* of the home hazards, such as those involved in heating equipment, laundry equipment, wiring, and the use of inflammable fluids. They include *carelessness*, such as the disposition of toys, the presence of slippery surfaces, negligence in the supervision and instruction of children. They include *insensitivity* to the serious possibilities of home accidents, the great amount of

disability involved, through fractures, dislocations, strains, cuts that may become infected, etc. All in all, a very substantial portion of the problem appears to be subject to educational approach and potential control.

CONCLUSIONS

1. In home accidents there is an extensive waste of human values, largely preventable by construction regulations, by legally enforceable standards as to home equipment, and by home accident education as to equipment and living methods, especially the latter.

2. Public health and visiting nurses, in addition to the aid which they furnish in giving care to the injured, have demonstrated in this inquiry that they may perform a very useful service in adding to our knowledge, by accumulating data for analysis. The more general adoption of specific procedures, with appropriate record forms, and home hazard check lists will promote this end. Further, their interest in the problem is easy to arouse and should be augmented through staff education programs, undergraduate and postgraduate curriculum enrichment, and other means. There is much that they can and will do through their home contacts to teach the principles of accident prevention, if they are sensitized to home needs in this regard. To some extent also this would no doubt apply to other periodic home visitors, such as inspectors for various purposes, home demonstration agents, visiting teachers, insurance agents, and others. Nurses, agents, and others with advantageous home contacts can with advantage be implemented with appropriate home accident prevention literature from official or private sources, and with other educational devices.

3. For the local health department, the home accident field offers a remarkable opportunity. Its work here as it develops will no doubt be carried

out in close coöperation with other agencies, such as fire departments, safety councils, schools, and insurance companies. The department will presumably want to develop its own literature in this regard, and can also make advantageous use of instructive material from other sources. The department can encourage its own nurses to look for home hazards, to be aware of the results of such hazards, and to be on the alert for the elimination of unnecessary dangers.

On the highway and in industry, the volume of accidents varies from time to time, influenced by the volume of traffic, the amount of employment, the pressure upon industrial and commercial activity, etc.—a volume that is now expanding, with our increasingly intense national activities. But the home accident problem is comparatively stable and its trend predictable. The human exposure to home hazards is more or less constant, and throughout the country people are going to continue in about the same proportions to live in homes, whether they be apartments, flats, farm homes, or family dwellings.

Accidents in the home which lead to

incapacity or to fatalities among useful or promising members of society—adult or child, male or female—are in the same category of wastefulness in our national economy, as are similar losses in essential industries or in the nation's armed forces. Even accidents which lay up for long periods of time aged members of family groups—so common in the home—place a handicap on the efficiency and happiness of the family unit. According to the National Safety Council, 61 per cent of deaths and injuries to industrially employed persons occur while not at work, and in large proportion while at home. Certainly, under present conditions, we have in the home, from the angle of conservation of human resources, a place where the health department, with its allies, and on a basis of its other home services, can perform, through its educational technics, a basic service in accident prevention, advantageously affecting individual, family, community, and national welfare in this pressing time.

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Adolescence and Public Health

LAWRENCE K. FRANK

Vice-President Josiah Macy, Jr., Foundation, New York, N. Y.

WITHIN the past few years the adolescent has come into the focus of medicine and public health. As it was twenty years ago when the pre-school child began to claim attention, it is now discovered that adolescence is a much neglected period of life. A brief review of what is known about this period and of some implications for public health may be of interest.

DEMOGRAPHIC AND MORTALITY DATA

First, as to the demographic and mortality picture during the second decade. The continued decline in the birth rate, which was reflected in the 1940 census by a further reduction in the number of children under 5, has not yet influenced the number of adolescents, but it is clear that within the next decade there will be a reduction in the number of children between 10 and 19 years of age. This diminution in the child population has been reflected in a decline in elementary school enrollments which, in the larger cities, has been marked. The secondary school enrollments may not register this change immediately if a larger proportion of children, as seems probable, continues through the high schools. It should be noted that the rural regions, especially in the South, continue to have a higher birth rate than elsewhere and therefore do not show these declines in child population. It is these regions which are less adequately provided with educational, health, and welfare agencies for child care.

The lowest death rate for all ages occurs in the age group 10 to 14, followed by a rise in the age group 15 to 19. It should be noted that until recently the female death rate, in the period 15 to 19, has been higher than the male, although lower in all other age periods. The pronounced reduction in the death rate that has been achieved in infancy has not been attained in the second decade, indicating that these already low rates are less susceptible to improvement or that this period has benefited less from advances in medicine and public health. During the second decade boys and girls are seen less frequently by the private physician, even among the well-to-do families who discontinue the periodical health examination as their children reach 9 or 10, or earlier. Moreover, even the limited health services of the elementary school have not been provided in the high schools to any large extent. Thus the adolescent may, and often does, receive little or no health supervision or medical attention unless acutely ill.

GROWTH, DEVELOPMENT AND MATURATION OF THE ADOLESCENT

During the past ten or fifteen years intensive studies of growth, development, and maturation of boys and girls during the second decade have been in progress, from which will soon come reports that will help to illuminate this period of life. Some of these studies have been longitudinal, that is, continued observation and measurement

of the same children from 9 or 10 years of age to 18, thus providing a better understanding of the processes of growth and development as they appear in individual children.¹ While only a few preliminary reports have been published, some of the major findings of these studies are now becoming available.

It is being found that there is an orderly sequence of growth, development, and maturation through which children, unless specifically defective or handicapped, will pass between childhood and adult maturity. But it is evident from study of individual children throughout this period that each individual child, in accordance with his inherited constitutional pattern and the adequacy or inadequacy of his nurture, will pass through this sequence at his or her own rate. Thus each individual child undergoes this orderly process of growth and development at different ages and with different rates of progress; moreover, he signalizes his attainment of different stages in this process by structural and functional dimensions that are uniquely his own. This idiomatic development of the individual merits emphasis because the cross-sectional study of children, using a different group of children for each age period to establish age norms, has ignored these individual differences and sometimes has created confusion and misunderstanding.²

An analogy may be appropriate to illustrate the idiomatic process of development. If a group of boys and girls start from New York to go to Chicago, some of them may travel by airplane, others by fastest railroad train, still others on the bus, or by private car, while a few will attempt to hitch-hike their way, and a small number may trudge along on foot. The children traveling by each of these different modes of transportation will arrive in Chicago at different times and in different states or conditions, since each mode

of travel exposes the individual to different risks or costs and brings the traveler certain advantages from traveling in that manner and at that speed. Moreover, it is probable that each mode of travel and rate of development involves more or less specific requirements of nurture to maintain the organism while undergoing such changes.

Since the term *adolescence* is used with various meanings, it may be desirable to recall that man has not only a prolonged infancy but apparently has the longest period of adolescence. It would clarify the discussion of the second decade to recognize three periods or stages, namely, the pre-pubertal, puberty, and adolescence, and to limit the term adolescence to the post-pubertal period of the second decade. We should, of course, realize that growth and development of the child is a continuous process from conception on, but may be viewed in terms of the more or less well defined stages or periods for purposes of study and discussion.

PRE-PUBERTAL PERIOD

The pre-pubertal period begins approximately around 9 years of age when the child has usually reached a stage of relative stability. Then begins, or more accurately we should say then occurs, an acceleration of growth and developmental processes, notably in the skeleton and in the elaboration of sex hormones. Recent studies have shown that both male and female sex hormones are recoverable in the urine of the child as early as 5 years of age, but they increase in volume during the pre-pubertal stage at which time there is ordinarily a growing predominance of male or female sex hormones, culminating in the male or female puberty.

Thus it is being shown that the rate of pre-pubertal development may be very rapid in some children and bring them to puberty at an early age, while in others the process may be prolonged

until fairly late in the teens. Girls may reach puberty, as signaled by the menarche, from the age of 10½ years to 17 or 18, and an almost equal range is shown by boys, although boys tend to mature later than girls. It may be pointed out that a confusion about puberty has grown up, due in part to the ambiguity of language. It has been asserted that the tall girl, for example, will reach the menarche earlier than the short girl, which is true in so far as the girls who are tall during the pre-pubertal period may attain the menarche at a relatively early age. However, it has been shown that such girls will ordinarily not reach a terminal height equal to those girls whose menarche may be delayed until 16, 17, or 18, since this latter group of girls usually continues to grow and thus reach a terminal height in excess of all other girls.³ Somewhat similar observations have been made on boys, since the short, muscular boy may attain puberty in advance of the boy who reaches a greater height but who reaches puberty later. In general, therefore, it appears that puberty occurs later in the boys and girls who continue to grow and attain a higher stature, since sexual maturation seems to check or stop growth in stature.⁴ After puberty there may be an increase in sitting height with little increase in length of legs. In the pre-pubertal years, girls usually grow more rapidly than boys and exhibit greater stature but are overtaken by boys after puberty. It seems clear that there are pronounced individual and constitutional differences in the pattern and rate of development during the second decade that have large significance for programs of education and health care of adolescents.

An examination of the individual boy or girl moving through the second decade, especially those who are accelerated, will often reveal a condition of biological asymmetry or incongruity, as

shown by the different rates of development of organ systems. For example, some boys will attain almost their full adult stature within a brief period of 18 months, but may continue to exhibit relatively juvenile characteristics in the genitals and in the cardiovascular, respiratory, and other organ systems, which have not caught up, so to speak, with their adult stature.

Again it has been made clear by recent investigations that the menarche marks only a stage in sexual maturation⁵ since it may require as much as 1, 2, or more years before a girl achieves some degree of menstrual regularity.⁶ Moreover, it appears that the beginning of ovulation may be deferred for several years following the menarche, thus indicating that further maturation and development of the gonads and the genital organs are necessary before full sexual maturity is attained.⁷

It may also be pointed out that the processes of growth and development and maturation, especially when accelerated or retarded as frequently observed among adolescents, may be accompanied by a greater or less degree of physiological instability and incoordination. Not only uneven growth and development may involve physiological instability, but the less dramatic changes in dimensions accompanying so-called normal growth also interfere with stable functional activity as shown by the variability of response and performance. Also, it may be noted that with the change in body size, especially among that group of boys who grow very rapidly around 14 or 15 years of age, there may be a pronounced muscular imbalance and incoordination. Such individuals are almost suddenly confronted with the necessity of developing new eye-hand coordinations and use of the body because their rapidly changing size has disorganized their former motor habits and performances.

THE QUESTION OF NORMAL STANDARDS

The emphasis placed upon variations in the pattern and rate of development and upon the wide differences in the structural and functional dimensions attained by individual boys and girls may be justified in view of the tendency to set up fixed norms for chronological age groups to which individual boys and girls are expected to conform. These norms are modal or average values or central tendencies to which only a portion of the subjects conform. In so far as this tyranny of the norm may operate against a better understanding of adolescent needs and possibilities and not infrequently work to the disadvantage of the individual, it should be more clearly recognized. The development and refinement of methods, such as hormone assays, x-rays of skeletal development and maturation, assays of nutritional levels and requirements, especially of vitamins and minerals, and measurements of other physiological functions, offer promising instruments and procedures for those who wish to assess the development and maturation of individual boys and girls. It is no longer necessary to rely only upon measurements of height and weight or to limit attention to temporary status. As recently pointed out by Krogman,⁸ "We must differentiate between trend and phase, must recognize that comparable points may be far apart on the scale of time, and *must envisage progress rather than status.*"

NUTRITIONAL STATUS

Recently more attention has been given to the physiological functioning of adolescents, especially the nutritional status of the boys and girls exhibiting different patterns of growth and development. As indicated earlier, each of these different ways of traveling from childhood to adult maturity carries with it certain organic liabilities and requirements which may be very pronounced,

as in the case of the boys who are growing very rapidly and presumably have an increased need for calcium, phosphorus, and vitamin D. How far a systematic effort to provide more adequate care and nutrition during the second decade of life might yield large results in better health and increased capacity for meeting the demands of maturity, is a question for which no definite answers are now available. A current study in two New York City secondary schools, of low and high economic status, employing the latest methods for assessing nutritional status and deficiencies will provide much needed data on this question and indicate what might be desirable as a program of experimental nutrition of adolescents.⁹ Another current study in Pennsylvania will also provide data on a group of boys and girls who have been under scrutiny for several years.¹⁰ The provision of a regimen for adolescents conceived in terms of the requirements of growth and development and maturation as idiomatically expressed by individual boys and girls, offers an unexplored but promising opportunity in which public health officials could collaborate with educational agencies, recreational organizations, and the family. Moreover, in the light of the recent studies on adolescence and the investigations coming from medical and biological research, it seems probable that some of the functional disabilities and incapacities found in the adult population might be reduced, if not avoided, by greater attention during the second decade to the needs and functional disabilities of individual boys and girls.¹¹

It seems probable that some of the psychosomatic disorders of adults begin or are fixated in different organ systems during adolescence. This question is being explored but no definite findings can be cited today. The physiological instability during adolescence yields to the more or less "steady state" of ma-

turity in which persistent imbalances and incapacities may be fixated, as indicated by the individual variations in adult homeostasis.

It may be suggested that preoccupation with the diagnosis and correction of defects has obscured the more fundamental task of improving the vitality and the functional capacity of boys and girls with these large individual differences in patterns of growth. The defects that are corrected may be symptoms of deficiencies or inadequacies of nurture and ways of living which continue unremedied by the corrective treatment of defects. This points to the possibility that medicine and public health may contribute more to education than the customary diagnosis and correction of defects by bringing a knowledge of growth and development and the requirements for adequate functioning to bear upon the whole educational process, including the buildings and equipment, daily programs, teaching schedules, and the like. It is probable that a searching evaluation of what our schools are doing to and for children during the second decade would reveal many practices that are either handicapping such children or imposing additional stresses and strains, if not creating difficulties that will seriously impair the individual's future.

The discussion thus far has stressed what is beginning to appear from the study of physical growth and development, but it is of equal importance to recognize the process of personality development as it takes place during the second decade, because of the large significance of this time for the individual's future conduct and his mental health. The adolescent's emotional reactions are also of importance to any program of health care during the second decade.

EMOTIONAL REACTIONS OF THE ADOLESCENT

It is being pointed out with increasing emphasis that the adolescent boy or

girl is often subject to considerable anxiety about his or her normality, especially when confronted with the usual requirements made upon children according to chronological age. Boys who lag in stature behind girls of equal age are often self-conscious and belligerently hostile to girls in their school classes. Both boys and girls are concerned about the size and shape of their bodies, particularly about the adequacy of their genitals. In so far as they suffer from these anxieties they may be sensitive and retiring. While parents and teachers complain about the troublesome adolescents, it must be remembered that the adolescent himself may be in a condition of acute confusion and worry about his changing body, his lack of organic coördination and stability, and his inability to measure up to the many new and exacting demands that are almost suddenly thrust upon him at this period, while he is already suffering from emotional disturbances.

As indicated earlier, the processes of growth, development, and maturation are continuous from birth onward. What the child has experienced in infancy and childhood is a part of him, both organically and psychologically, and continues to operate throughout adolescence and adult life. Intensive study of adolescents is showing how many of the conflicts and emotional disturbances of early childhood are revived at puberty.¹² The boy or girl who has had an unhappy childhood, marked by overt conflicts with parents and rivalry with siblings or by fears and anxieties, may, at puberty or shortly after, revive these difficulties which have been more or less quiescent for several years. Likewise early worries about sex differences and other sources of anxiety over sex are liable to renewal at puberty. These older persistent difficulties therefore come to the surface during adolescence and are exhibited in often stormy family scenes and disturbances in school.

While in many other societies, what a child is taught serves to guide and prepare him for later living, in our culture we confront the adolescent with many sudden discontinuities, expecting him to forget and relinquish what we have taught him earlier and to accept new and often contradictory lessons as preparatory to adult life.

During childhood it is customary for parents to demand unquestioning obedience and conformity to their requirements. Children are expected to accept what their parents believe and say, and to submit to whatever the parents decide for them. Then almost suddenly, during adolescence, boys and girls are expected to assume responsibility for their conduct and to exhibit an increasing amount of independence and good judgment. The transition from the submissive, unquestioning obedience of childhood to these new responsibilities for conduct presents a difficult and often bewildering problem to many adolescents. These difficulties are enhanced and loaded with emotional conflict when the parents oppose these efforts of their sons and daughters to grow up and resist their every attempt to become independent and self-governing. The adolescent's struggle to escape family ties or domination are usually accompanied by an acute need for their reassurance and support which is rarely declared but is evidenced in many indirect forms of dependence.

THE PROBLEM OF SEX EDUCATION

It is also our custom to deny young children an understanding of sex differences, of mating and sex functioning. They may ask questions and earnestly seek to understand but we prefer to confuse their young minds and obscure the whole area of sex knowledge. Thus when in adolescence they are confronted with puberty and the development of genital functions and all the accompanying alterations of sexual maturation, they

are again faced with a sudden and often dramatic reversal of their childhood teachings, notably in the various forms of warnings and threats offered as sex education. So much of what is told adolescents about sex is in the form of dire prophesies of disaster and of almost terrorizing dangers of venereal infections. If the adolescent, therefore, is further confused by this process it is not difficult to understand in the light of his earlier teachings or misinformation. Moreover, the concern shown by teachers and guidance workers for the development of normal interests in the other sex, as a necessary step toward adult mating, contrasts strongly with their childhood experiences and with this anxiety-producing form of sex education.

It is also worthy of note that in accordance with our traditions, children are given a more or less unreal picture of life and people, of how society operates, and why things happen as they do. Children grow up, therefore, cherishing many illusions and usually are wholly unprepared for the demand that they put aside their fantasies and illusions and face the actuality of life around them with all the major readjustments this may entail. If they do accept the requirement to face reality and become more or less "hard-boiled" and cynical, they are apt to be scolded for lack of ideals; while if they develop altruistic aspirations and join lost causes they are accused of lacking sense and proportion or threatened with loss of their mental health.

These and other transitions should be recognized in the situation facing adolescents for which they can find little help or guidance. Moreover, it is important for physicians and public health officials to recognize this situation because it gives some clues to the resistance often exhibited by adolescents to their proffered services. The adolescent may, because of anxiety over his normalcy and

his genitals, be unable to ask for help or information however desperately he craves it. He or she may even be unable to answer direct questions on these topics because they are so disturbing. Such refusals or silence may therefore be misinterpreted or misunderstood unless it is realized that the adolescent is liable to such stresses and resistances. Likewise, adolescents may resent well meant and much needed advice offered by health and guidance workers because they are fighting against parental solicitude or domination and fear all other adults in authority. Even the appeals made to their enthusiasms and loyalties may be resented because adolescents suspect they are being again misled and fooled by adults as they were in childhood. Thus the health programs for adolescents may meet with a number of unexpected difficulties and obstacles that are explicable in the light of the adolescent's past history and current preoccupations, as recent studies are showing.¹³⁻¹⁷ The school physician and the public health official must therefore often abandon the direct or didactic approach to the adolescent and seek, through other avenues, to effect needed changes in living, eating, and personal hygiene. The desire of the adolescent to be like his contemporaries and to do as they do offers possibilities for group programs which may bring desired changes in diet and so on, not easily obtained by persuasion of individuals.

THE PROBLEM OF DELINQUENCY

Within recent years the study of delinquency has shifted the older legal view toward a recognition of delinquency as a symptom of frustration, defeat, and personality difficulties which often arise from the confused and conflicting neighborhood and family life of adolescents and pre-adolescents. This change in viewpoint and in treatment of delinquents indicates a coming realization that delinquency may be considered

as a public health problem. Means must be devised to deal with the adverse neighborhood and family conditions fostering delinquency just as we have learned to deal with contaminated water and milk supplies and the spread of infections or parasites. Likewise, ways must be found to offset, if not to eliminate, the situations and conflicts which threaten the mental health of adolescents which also is emerging as a public health problem of greatest urgency. It is to be noted that clinical diagnosis and therapy for individual delinquents or those with mental health hazards have had only a limited efficacy, thus indicating that a community-wide or neighborhood program of conservation of adolescents may be necessary for any larger achievements.

OTHER IMPLICATIONS

Heretofore it has been customary to think of health and sanity as something that was lost by some mysterious process, or was taken away as punishment for the individual's wickedness and unworthiness. There is a growing realization coming from various investigations and intensive studies that health and sanity have to be achieved by meeting the demands and the tasks of life with vitality and courage. This appears very clearly in the life of adolescents and therefore makes the second decade an important period for preventive medicine and mental hygiene, provided we can devise programs adequate to the needs and requirements of adolescents.

It begins to appear that in the larger task of health care, the care and guidance of our adolescent population will increasingly demand the utmost of our knowledge and courageous planning for the future.

We may regard the child and adolescent as sensitive indicators of the social and family conditions out of which they emerge, and recognize that these conditions are susceptible to modification and

improvement, in the light of the new knowledge of growth and development and the basic requirements for health and sanity.

This is not intended to imply that the public health officers are to be saddled with the full responsibility of managing all our social life, but it does suggest that in so far as they become concerned with problems of adolescent health, hygiene, and welfare, they may be justified in pointing to these community and neighborhood situations as contributing to, if not creating the human wastage that appears increasingly preventable. Vigorous leadership in this direction is needed to formulate a constructive program for the conservation of adolescents, which, to be effective, must elicit acceptance and support both from the general public and from the numerous professions and agencies and organizations that are dealing with adolescents today. An orchestration of these on the theme of more adequate nurture, care, and protection of adolescents is very much to be desired and might be furthered if a broad, comprehensive program to this end were presented by public health officers. In any such endeavor the growing knowledge of growth and development and maturation of children and adolescents now coming from the various research centers throughout the country, including the clinical studies of personality and emotional development, should give medicine and public health increasing confidence to undertake this task.

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NOTE: Current studies of child growth and development are being published by the Society for Research in Child Development, National Research Council, Washington, D. C., through its monographs on child development.

Population Variables and the Public Health Worker

EARL LOMON KOOS *

*Department of Public Health and Preventive Medicine, Cornell University
Medical College, New York, N. Y.*

THE force of mortality pressing upon a people may in some degree be weighed and measured by accurate enumeration of the number and ages of the living, and the location, circumstance and causes of death and intelligent abstract of these facts."¹ Were Shattuck alive today he might add that an enumeration of the conditions under which people *live* is also an accurate measure of the force of mortality *and morbidity* pressing upon a people, for there is an increasing awareness that every circumstance which affects the individual throughout his life is the concern of the public health worker. Modern medicine recognizes that none of the factors which contribute to the malfunction of an individual can be disregarded, and that his personal and social relationships are significant factors in the determination of his fitness as a citizen. Such variables as the size of the family, composition of household, intra-family relationships, and the socio-economic characteristics of the environment are therefore the concern of all in the public health field.

That we are aware of this concept but fail to employ it to the fullest extent is demonstrated by the lack of use of census tract material. The Bureau of the Census set up for the 1930 census certain uniform and permanent areas

for statistical reporting in 18 cities. The responsibility for publishing the data rested with local committees. At the end of the decade only 10 of these had made available all the data offered, the others using only a small part or none at all.² Some of this apathy may have been due to a lack of funds, but for 1940 this is obviated by the inclusion of more detailed data in the regular publications of the Bureau of the Census. Thus, in reporting this sixteenth census, the Bureau will publish data for more than 60 cities, by census tract, for race, nativity, sex, and age; education, unemployment status, occupation group, school attendance, country of birth, and citizenship (all by sex); and certain housing characteristics. The sole responsibility of health workers, therefore, is utilization of the data.

Two main values are inherent in the use of these variables: (1) in evaluating present practices in public health, and (2) in the charting of future services.

The purpose of this brief paper is to discuss some of these variables and to point out their value for public health technics.

The readily recognized and most used variable is, of course, the classic in demography: age and sex. Wide variations in the age-sex composition of the population of a city or other political unit are recognized, but are insufficiently taken into account. Chart 1 shows

* Under grant from the Josiah Macy Jr. Foundation.

POPULATION VARIABLES FOR THREE CENSUS TRACTS IN NEW YORK CITY

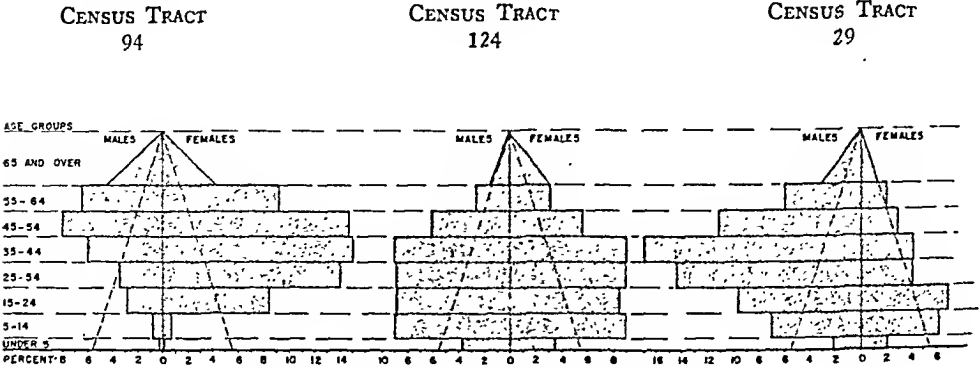


CHART 1—Variations in Age-Sex Distribution

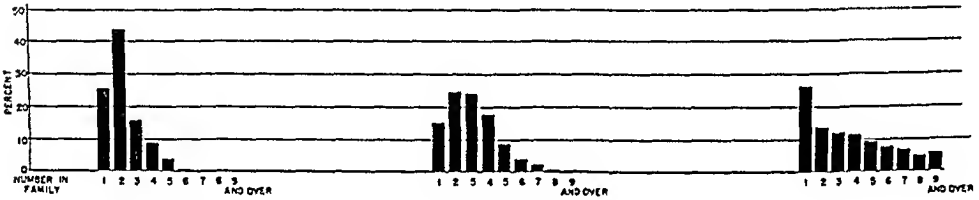


CHART 2—Variations in Per cent Distribution of Families by Size

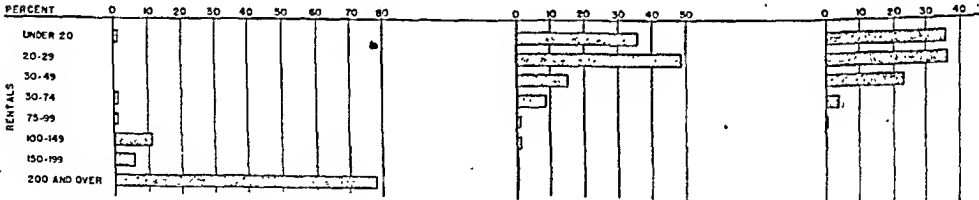


CHART 3—Variations in Per cent Distribution of Rents (A Socio-economic Index)

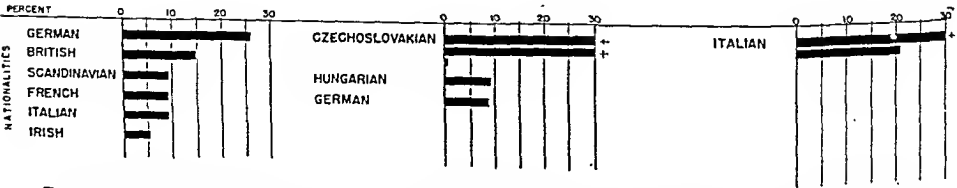


CHART 4—Variations in Per cent Distribution of Major Nationality Groups. By nationality of head of family. Only nationality groups having 5 per cent or more of total population are shown.

three extremes in census tracts in New York City. Tract 94, in a section of the city that is characterized by expensive hotels and apartment buildings, shows an unusually high frequency of females 25 to 54 years old, with an accompanying dearth of children under 15 years. Tract 29, in the "flophouse" section of the Bowery, shows an equal skewness in the distribution of *males* 25 to 54 years old. Tract 124, in a tenement section, has a more usual distribution of all ages. Obviously the health needs of these three areas are not comparable. Tract 94, with its expensive hotels and apartments, on casual analysis needs little public health activity; but analysis of its population figures (Chart 1), of family composition (Chart 2), and of the socio-economic status as indicated by rentals (Chart 3), shows a disproportionate number of unmarried women in this tract, presumably servants. Certain types of health service and health education are therefore necessary in this tract to meet the needs of this group. On the other hand, a child health station in this tract would soon close its doors for lack of patients, a fact clearly shown by the population figures..

Tract 29, on the other hand, shows an entirely different picture of family composition. Upon correlative analysis we find large numbers of men, large numbers of single persons, and at the same time relatively large numbers of families with many members. This is indicative of two vastly different types of population within the small area of the census tract. In the former, the specialized services peculiar to large numbers of unmarried men, such as venereal disease clinics and chronic disease services, are mostly indicated; in the latter, extensive clinic services designed for family groups are indicated.

In the case of tract 124, with its more usual distribution of age groups and sex, need is indicated for the clinics and services designed for family use, such as

well baby clinics, prenatal clinics, etc.

Spot maps, while of value in themselves, have their usefulness greatly increased when used in conjunction with such age group statistics as are here illustrated. As a device for showing the spread of case loads, the map is unexcelled, but without this correlative use of age statistics, there is no means of determining the relative effectiveness of a service in reaching the potential case load. As an example, the author recently discussed with clinic workers the case load of a well baby clinic. The workers pointed with pride to their enrollment of more than 100 babies from one census tract, and failed to realize (from their spot maps) that there were more than 300 eligible children in that tract, about two-thirds of whom received no medical attention other than in case of acute illness. The correlative study of the map *with* the age-sex statistics would make for a better coverage of the tract in a case such as this.

The *size of family* variable is of use in determining the areas needing such services as we have mentioned. Chart 2 shows the characteristic scarcity of children in an area of high economic status. The question of economic status is determined in this case from an examination of the rental distributions in Chart 3. The variation in rentals among the three tracts is apparent from the chart.

Foreign-born population by country of birth data are especially valuable in recognizing the cultural factors inherent in the people of certain lands which make modern health programs difficult to establish. Chart 4 illustrates this variation. The foreign born of census tract 124, predominantly Czechoslovakian, are health conscious to a remarkable degree, although with certain biases; while the health pattern of the Italians, predominant in census tract 29, is often at variance with that established in the American culture. The

educational approach to the two groups can in no way be the same, and this fact must be recognized in setting up a health program.

Socio-economic variables, such as rentals, are of value in determining those areas most likely to need health service, especially in times of epidemic, and these should always be considered in relation to the housing variables.

Housing variables are of value in locating the areas where disease can be expected to be most prevalent. This subject is well covered in studies of the Environmental Sanitation Section of the National Institute of Health, and need not be repeated here.³

SUMMARY

The reporting of population data by census tracts for 61 cities in the 1940 census makes possible a more detailed analysis of demographic data than ever before. By utilizing the population and socio-economic variables, the health worker is able to analyze local material more effectively, and to plan future services more adequately. This is a long step forward in promoting effective public health administration.

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CHRISTMAS SEALS



*Protect Your Home
from Tuberculosis*

Plague Situation in the Western United States*

R. H. CREEL, M.D.

Medical Director in Charge, U. S. Public Health Service, San Francisco, Calif.

BUBONIC plague gained entrance into San Francisco in 1899 or 1900 and, although eradicated in that city more than 30 years ago, the infection is still widespread in wild rodents of California and the Pacific Slope area. The epidemiological and historical aspect of this development has been the subject of many papers presented before this and other organizations that are interested in public health. The purpose of this paper, therefore, is not to discuss the academic aspects of bubonic plague, but to analyze the various factors that have contributed to the creation of foci of the infection in this area and to suggest measures that can control and eradicate the infection now residual in the wild rodents of the Rocky Mountain States and the Pacific Slope.

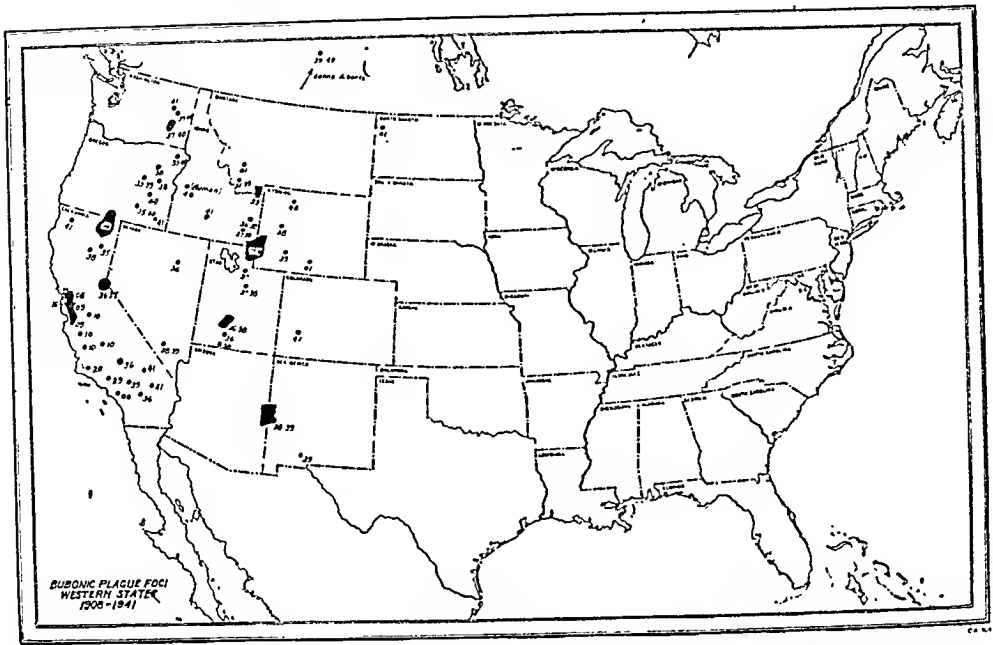
During the past forty years, bubonic plague has steadily progressed from a small area in San Francisco to the length and breadth of ten western states without any serious effort being made in recent years to stop its eastward extension. If the infection eventually reaches the Mississippi Valley, and this may very well develop, the record will be a lasting memorial to the apathy of public health administration in the western area of the United States.

With the exception of California, efforts to control the infection have been sporadic and feeble. In various sections, there has been either indifference, lack of appreciation of the potentialities, or a feeling of helplessness. Eradication is regarded as insuperable, but a review of the record will hardly support such a contention.

Plague was first known to exist in San Francisco in 1900. Since infection had already reached Hawaii the year before, it seems probable that the same vessel was the infecting vehicle of both Honolulu and San Francisco. Parallel developments have occurred elsewhere, notably in 1912 when a vessel from the Canary Islands carried infected rats to Puerto Rico and Cuba and possibly New Orleans on the same voyage.

Early in March, 1900, the city physician of San Francisco whose duty it was to examine dead Chinese who had not been attended by a regular physician, notified Dr. W. H. Kellogg, then bacteriologist of the San Francisco Health Department, of a case in which the cause of death was obscure. Dr. Kellogg observed a large femoral bubo in the dead man, and from a bacteriological examination of the tissues diagnosed the case as bubonic plague. Dr. Joseph Kinyoun, of the Marine Hospital Service, then on duty as quarantine officer of Angel Island, confirmed the diagnosis by animal inoculation and

* Read before the Western Branch, American Public Health Association at the Twelfth Annual Meeting in San Diego, Calif., May 29, 1941.



ably supported Dr. Kellogg in the bitter fight that ensued. Considering that plague was an exotic disease at that time and that in the United States its pathology and symptoms were comparatively unknown, the laboratory diagnosis made by Dr. Kellogg was a remarkable achievement and a tribute to his professional genius.

The announcement that plague existed in San Francisco was very bad news indeed to the commercial interests of California. The publicity obviously would deter tourists and injure business; therefore, the existence of plague was denied by the state administration, all of the San Francisco papers except one, and practically all commercial interests. A campaign was launched by the state officials, the San Francisco press, and the most eminent legal talent that Chinese money could buy, that for vilification and indecency reached an all-time low. The less said, the better, but those interested can obtain a vivid and interesting account of the whole affair in an article by Dr. W. H. Kellogg in the November, 1920,

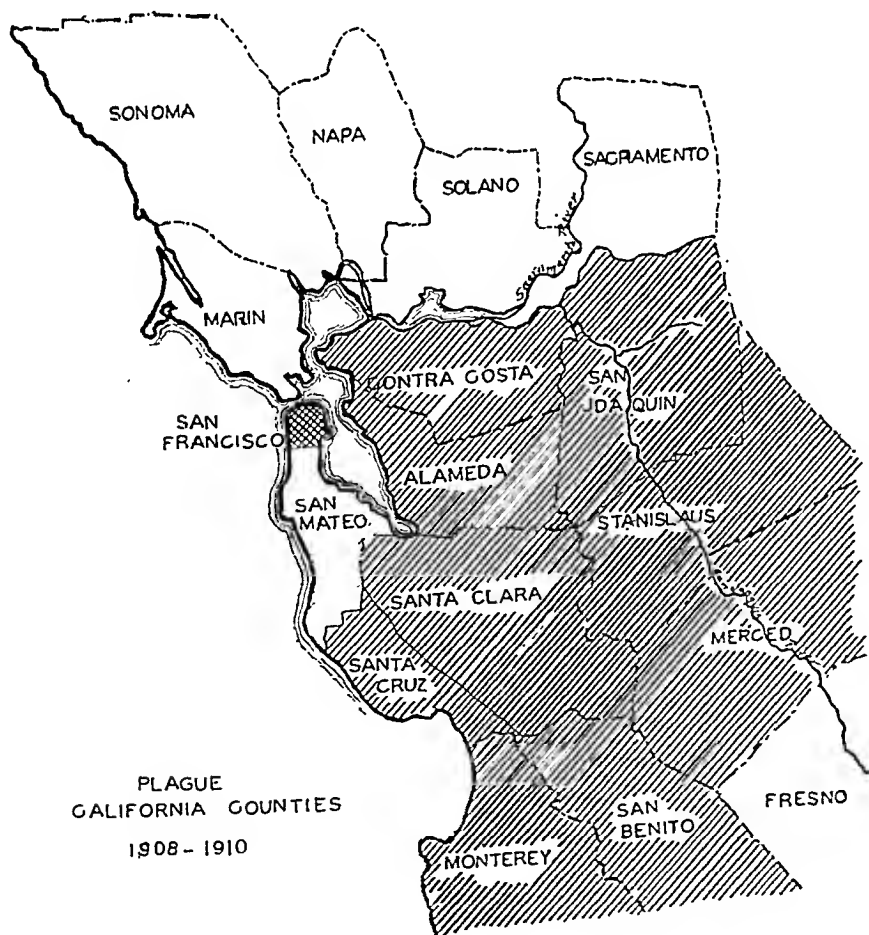
issue of the *American Journal of Public Health*. The one bright and redeeming feature of that sordid episode was the courageous and honest conduct of the San Francisco City Board of Health and the Mayor, who never at any time hesitated nor flinched in the performance of their duties despite the flood of scurrility and abuse. Suffice to say that within the next two or three years there were reported 121 cases of plague and 113 deaths, practically all confined to the Chinese quarter. The approximation of cases and deaths suggests that there must have been many other cases either concealed or erroneously diagnosed.

Because of the bitter opposition in part and partly because of inadequate epidemiological knowledge, the infection was pronounced eradicated in 1904, based solely upon cessation of human cases. No rodent survey was maintained and from subsequent developments, we know that the rodent infection was merely latent, to be spread throughout San Francisco after the catastrophe of 1906. Human cases ap-

peared in all parts of the city in 1907, and in that recurrence there were reported 160 cases, probably substantially less than the actual number. I can recall seeing two cases then that had been treated—one, for tonsillitis, the other for mumps—both having cervical buboes. The real diagnosis was confirmed by post-mortem examination. If in 1900 there had been the same public support to the eradication campaign that was accorded in 1907 and 1908, plague infection in this country might very well have been exterminated. The golden opportunity passed, however, and somewhere between 1900 and 1908 infection had extended into the ground squirrel population of California. In the latter year, a human case of plague was reported in

Contra Costa County near Bay Point. An investigation resulted in the discovery of infected squirrels not far distant from the river wharves. In retrospect, it was recalled that a human case had been reported from that general locality in 1903. It seems probable that infected rats, either on a vessel direct from the Orient or from San Francisco, had landed at Port Costa or thereabout prior to 1903.

Upon the discovery of squirrel infection, there was instituted by the U. S. Public Health Service a campaign that at first was directed against the squirrels of Contra Costa County only, and in the remainder of 1908, there were 550 squirrels destroyed, of which 4 were infected. However, the occurrence of a case of human plague near Sunol,



Alameda County, in August, 1909, followed by a survey, revealed widespread infection among the Alameda County squirrels. From then on, the campaign expanded and infected squirrels were found in several of the contiguous counties.

In August, 1908, a human case occurred in the outskirts of Los Angeles, and an infected squirrel was picked up near the railroad yard where grain cars were unloaded. A survey of 2 years' duration, and covering the examination of rats in Los Angeles City and 23,000 squirrels throughout the Los Angeles County, failed to demonstrate any rodent infection in Los Angeles County, and made it apparent that the one infected squirrel found was probably imported by railroad car from the East Bay Region. That there had been no overland extension was supported by a 2 year survey of the southern counties, with the examination of squirrels in Los Angeles, Ventura, and Santa Barbara Counties, without revealing any rodent infection. Shortly following this, a very intensive and widespread survey of Fresno, Santa Barbara, Ventura, Tulare, and San Mateo Counties failed to show any infection. One infected squirrel was found in the extreme northern edge of San Luis Obispo County in 1910 but the examination of some 10,000 squirrels in the subsequent 2 years was negative. These results, together with negative findings in many other counties, would appear to refute the theory that plague had been existent for many years in the California ground squirrels.

The campaign against squirrels was slow in getting under way but by June, 1909, 5,000 squirrels in Contra Costa and Alameda Counties had been examined and 42 found infected. In the year 1910, 122,000 squirrels were shot and examined, of which 386 were found infected. The known infected counties at that time were Contra Costa,

Alameda, Santa Clara, San Benito, Santa Cruz, Stanislaus, San Joaquin, and Merced Counties, with the greatest infection in Contra Costa and Alameda Counties. In the year 1911, 126,000 squirrels were examined with 55 infected. Intensive hunting and squirrel examination was instituted in San Bernardino, Riverside, Orange, and Imperial Counties, but no infection was found. A similar survey was carried out in Colusa, Napa, Solano, Mariposa, Madera, Tulare, Kern, and Fresno Counties, with likewise negative results. In addition to widespread hunting, poisoning and gassing of the infected areas was carried out vigorously during 1910 and 1911. Carbon bisulphide was the gas mainly used. About this time, it was noted that at least three passes through the Sierras were heavily squirrel-infested, and surveys were carried out in Washoe, Douglas, and Ormsby Counties in Nevada, Jackson County in Oregon, and several areas in Arizona—all with negative results.

In the (fiscal) year 1912, 56,000 squirrels were examined, of which 613 were infected, an infection rate of 11 per 1,000. Alameda and Contra Costa Counties furnished the bulk; one came from Fresno County; one, from Merced; and three, from San Joaquin County. In 1913, 30,000 squirrels were examined with 680 infected, an infection rate of 23 per 1,000. In 1914, 18,000 were examined, of which 177 were infected, a rate of 10 per 1,000. By this time, more stress was being laid on poisoning and gassing than on shooting. Squirrels were said to be so scarce east of the San Joaquin River that hunters were able to turn in less than one squirrel per day.

In 1915, 30,000 squirrels were examined with only 39 infected, an infection rate of $1\frac{1}{3}$ per 1,000, the known infection being limited to Contra Costa and Alameda Counties and San Benito County. The last infected squirrel



from Merced and San Joaquin was in the summer of 1911—4 years previous. With this showing, the management of the campaign became unduly optimistic, and a very substantial reduction was made in the field force. Whereas the U. S. Public Health Service had expended over \$200,000 in 1912, \$118,000 in 1913, \$133,000 in 1914, the expenditures were reduced to \$51,000 in 1915. In other words, the field force was reduced by two-thirds. The contributive cause for this reduction by the U. S. Public Health Service was the necessity of using part of the epidemic appropriation to aid the City of New Orleans, where plague had appeared.

In 1916, 53,000 squirrels were examined, of which 138 were infected, from Alameda, Contra Costa, Santa Clara, San Mateo, Santa Cruz, Monterey, and San Benito Counties. This was the first instance of squirrel infection in San Mateo County—8 years after the discovery of plague in Contra Costa County. Surveys of Mendocino, Lake, Sonoma, Kern, and Madera Counties in 1916 were all negative, as likewise a 6 months' survey in Modoc and Lassen Counties in California and Jackson County in Oregon. Efforts toward eradication continued to decline in 1916 and 1917, and in the latter year hunting was employed sporadically.

Infection was found in squirrels in the south end of San Francisco County, an extension northward from San Mateo County. This was the first and practically last time an infected squirrel was reported in San Francisco County. In 1918, 10,000 squirrels from all counties were examined, with 32 infected.

The U. S. Public Health Service, which up to that time had financed the campaign, turned over the work to the County Horticultural Commissioners in Merced, Stanislaus, San Benito, and Monterey and the other counties to the south, and confined its efforts to the Bay Counties of Alameda, Contra Costa, and San Mateo. From the latter area, 72,000 squirrels were examined in 1919, of which 124 were infected, a rate of less than 2 per 1,000. From the beginning, there had been almost 2,000 infected squirrels reported from Contra Costa County, between 300 and 400 from Alameda County, 1 from Fresno County, 7 from Merced County, 1 from San Luis Obispo County, 38 from Monterey County, 78 from San Benito County, 18 from San Joaquin County, 32 from Santa Clara County, 14 from Santa Cruz County, 13 from Stanislaus County, and 19 from San Mateo County.

In 1921, because of limited funds, control measures were turned over to the respective county horticultural commissioners and the U. S. Biological Survey in all counties. Only limited hunting in the Bay Counties was carried out through 1921, 1922, and on up to 1927. Human cases in Santa Cruz, Alameda, and San Benito Counties made it evident, however, that there was still infection in those counties. In the spring of 1924, the infection took an upturn. There was an explosive epizootic in San Luis Obispo, and in November of that year human cases appeared in Los Angeles. A survey of Los Angeles showed 9 infected squirrels,

7 being within the corporate limits of the city. In passing, it may be noted that the infection in Los Angeles may have been introduced through infected rats from a vessel or overland through infection in the ground squirrel population. It was significant, however, that no infection was found in the waterfront rats in Long Beach, Wilmington, or San Pedro, and also that the "marmot" type of infection prevailed in Los Angeles, *i.e.*, pneumonic form of plague. All the evidence, therefore, pointed to an introduction of the infection into Los Angeles through ground squirrels mingling with city rats in the suburbs.

Even before this, however, there had been a small outbreak of human bubonic plague of pneumonic type in Oakland in 1919, attributable to squirrel infection in Alameda County. In 1924, rat infection was found in the Oakland city dump. Here again, circumstantial evidence pointed to infection from the ground squirrels on the outskirts of Oakland and the possibility of an infected rodent being picked up dead and deposited in the household garbage and from there transported to the city dump where infected fleas lighted up epizootic among Norway rats.

Except for desultory hunting, the campaign languished from 1920 to 1934.

From 1908 to 1917, the campaign against the infection of ground squirrels was financed and operated by the U. S. Public Health Service with contributions over varying periods from some of the county governments, but with no financial assistance from the state. The earlier attitude of the state administration was that of denying plague and criticising those who asserted its presence. Later on, active opposition ceased and a passive attitude was adopted.

In 1927, because of financial inability

by the State Department of Health to effect any broad eradivative measures, a marriage of convenience was effected whereby control of plague infection was turned over to the State Agricultural Department. This served the double purpose of utilizing a force already engaged in squirrel suppressive measures for economic reasons and at the same time did not unduly publicize the continued prevalence of the infection in California. The Health Department continued to make surveys, but the appropriation by the Legislature both for surveys and control has continued to be wholly inadequate and but a small part of what it should be in order to permit of any effective work.

During the next 6 years, plague infection extended southward, and a sharp outbreak was noted in 1934 in Kern and Tulare Counties in the San Joaquin Valley, and to the north in Modoc and Lassen Counties. From there, the infection apparently spread northward into Eastern Oregon and Eastern Washington.

Three years later, in 1937, the infection had been discovered in San Bernardino County in the southern part of the state and in El Dorado County and Placer County located in the east-central part of the state. A survey by the U. S. Public Health Service forces starting in 1935 showed in progressive years that the infection had spread into Nevada, Idaho, Montana, and Utah, gradually infiltrating into Arizona, New Mexico, and Wyoming.

In addition to ground squirrels, prairie dogs, wood rats, marmots, and various other wild rodents were found to be infected.

SUMMARY

With the exception of California, no state department of health in the infected area of the 10 western states has made any attempt to eradicate plague

infection in wild rodents at any time, and during the past 20 years the U. S. Public Health Service, influenced by the indifference of state governments, has likewise attempted no eradivative campaign.

In the period 1909 to 1914, squirrel infection had been demonstrated in the San Francisco Bay Counties, in the San Joaquin Valley as far south as Fresno, and in the coast counties as far south as San Luis Obispo—an infected area of approximately 15,000 square miles—but by 1914, as a result of suppressive measures, the infection appeared to be delimited to a few scattered foci in Contra Costa, Alameda, Santa Clara, and San Benito Counties, and the infection rate had been reduced from 23 per 1,000 to slightly over 1 per 1,000 in the squirrel population.

The failure of early efforts to exterminate plague completely in California was due mainly to curtailment of funds influenced somewhat by unwarranted optimism at a critical period. In 1914, eradivative efforts reached high tide and might very well have been crowned with success had the campaign been sustained at that level for a year or two longer. Expenditures reflecting the scope of anti-plague measures in rural areas dropped from \$133,000 in 1914 to \$50,000 in 1915 and \$25,000 in 1916, although the rebound of infection was not noticeable until later on.

The territory worked over was by no means a small one, being 15,000 square miles of demonstrable infected area, and an uninfected area approximately twice that large.

Plague from ground squirrels was reintroduced in Oakland in 1919 and again in 1924, and in Los Angeles through a similar avenue in 1924.

The extension of the infection through ground squirrels and other wild rodents has been slow: 8 years traveling the distance between Contra Costa and

San Mateo Counties; 16 years traveling from Contra Costa County to Los Angeles; 25 years traveling from the Bay Area to Kern and Modoc Counties.

CONCLUSION

So much of what actually happened in the spread of bubonic plague in wild rodents in California and neighboring states was hidden and obscured that any conclusions are largely based on deductions. From all the evidence available, however, it seems justifiable to conclude that representation as to the impracticability of plague eradication in the western states is not based upon the results of any serious attempt to combat the infection. Surveys, although informative, have been disconnected, superficial at times, and not substantially eradivative.

Plague infection as it exists today in the western states can be exterminated by a well organized and well sustained campaign throughout the entire plague area, adequately financed and probably covering a 5 year period. The results might very well be encompassed within the limitation of a \$2,500,000 expenditure.

Unless controlled, plague infection can be expected to extend into any city in the western states having a substantial rat population. Likewise, there is no reason to assume that the infection will not spread to the rodents of the Great Plains and into the Mississippi Valley and Eastern United States.

Since the index of progress and the standard of eradication depends on laboratory examination of rodents, this latter should be continuous and co-extensive with control measures. Negative findings over a period of two years or seasons, provided that an adequate supply of rodents from worked-over areas has been examined in the laboratory, should be an acceptable standard of eradication. Poisoning, gassing

of burrows, and shooting should be coördinated, the latter procedure partly as a clean-up measure, partly for the purpose of producing specimens for laboratory examination as only a limited number of rodents are ordinarily recovered from poisoning and gassing procedures. The prolonged campaign is due partly to interruption of suppressive measures occasioned by the hibernation or estivation of many of the wild rodent species concerned. In some areas this permits application of eradivative measures for only a few months during the year.

While many species are involved, it is very probable that the main reservoir of infection is in ground squirrels, and that if infection is eradicated among these animals, it will spontaneously disappear in such species as the chipmunk, the marmot, wood rat, prairie dog, and other groups which do not have the density of population essential for the maintenance of an enzoötic reservoir.

Density of population is just as much a factor in the spread of infection among animals as it is among the human population. Total destruction of species is not essentially necessary in order to eradicate plague infection. This can be effected by a substantial reduction in the rodent population—sufficient to break the line of communication between infected and non-infected animals through the elimination of colonies and scattering of the population.

Inasmuch as the term "sylvatic plague," which has been used to designate the infection in rural animals, has created a misleading impression among some public health officials, this term should be discontinued as a synonym of bubonic plague.

NOTE: Since formulating the above report in May, 1941, it is to be noted that subsequently in June and July infected rodents were found by a Public Health Service Surveying Party in Divide County, N. D., and in San Miguel County, Colo.

Problem of Insecticide Spray Residue*

ALVIN J. COX, PH.D.

*Chief, Bureau of Chemistry, California Department of Agriculture,
Sacramento, Calif.*

MY subject deals with health hazards resulting from certain agricultural practices which bear directly upon general health. The many and varied sources of health hazards coming within the purview of public health officers are probably due not so much to entirely new ones as to sources hitherto existent, but unsuspected. Uncontrolled spray residue is a health hazard directly classifiable under the heading of those which have existed for many years, but about which little has been known or done until the last decade.

With increase in population and complexity of modern civilization, commercial practices have become standardized and single crop farming has largely succeeded subsistence farming. Large sections have become devoted exclusively to production of apples and pears, and in California entire communities are dependent upon these industries. The same is true with regard to celery, cauliflower, cabbage, and many other vegetables. With increased acreages and fewer isolated areas, menacing pests have increased and have necessitated greater application of poisonous insecticides: If these industries are to survive, the ravages of such pests as codling moth, corn ear worm, and other insect pests must be con-

trolled. Increased application of insecticides was carried on without adequate regard to the problems of spray and dust residues and their removal.

If a farmer or fruit grower is to get a yield of marketable crops it is necessary to spray or dust with economic poisons, that is, materials for mitigating pests; but any deleterious spray or dust residue must be removed in preparing fruit or produce for sale for human consumption. Among the common potent and economical means of fruit and vegetable insect pest control is the use of lead arsenate, calcium arsenate, and fluorine compounds, such as cryolite—all recognized poisons. Until comparatively recently, spray residues from these remained just where they had been placed—on the apple skin, the celery stalk, or on the cauliflower curd, until they reached the purchaser; and then frequently were not removed in the preparation for consumption as food.

Many an individual boastfully will eat a fruit carrying spray residue to prove that it will not hurt him, and in most cases no acute poisoning occurs. The obscure chronic effects resulting from years of continued ingestion of minute quantities of lead, arsenic, or fluorine is the menace at which government spray residue regulations are directed. In order to benefit the consuming public, this knowledge had to be translated into proper laws which

* Read before the Western Branch American Public Health Association at its Twelfth Annual Meeting in San Diego, Calif., May 26, 1941.

would be adequately enforced. In California there did exist a statute which, when properly amended, provided a practical means of control.

The next step involved the patient education of growers. We went to farms; we made it clear that arsenicals and fluorine compounds could be used for pest control, but when necessary growers or shippers must acid-wash fruit and so trim or otherwise condition vegetables that they would be sent to wholesale and retail markets within legal tolerances of lead 0.050, arsenic trioxide 0.025, and fluorine 0.020 grain per pound respectively. In many cases the bureau has aided growers and shippers to evolve and develop methods, processes, and equipment useful for removing several types of spray residue from many kinds of produce rapidly, satisfactorily, and at low cost.

In the early days of enforcement there were dangers of acute poisonings, but these always were small in comparison with the dangers of chronic intoxication, that is, a slowly developing, insidious undermining of health with body changes and disabilities like those of chronic disease. As the result of years of conscientious enforcement of the Spray Residue Article of the Agricultural Code of California, it can be said that the possibility of acute illness as a result of spray residue is slight. Nevertheless, regardless of the general amelioration of the spray residue situation, careful enforcement should be consistently carried on, and probably we will always have to reckon with spray residue. If inspection were relinquished, no doubt the hazard would recur.

At the outset enforcement of this legislation met with indifference and often with an openly manifested hostility on the part of farmers, fruit growers, produce merchants, and others directly affected by the enforcement. However, it did not take long to put

across the point that a few cases of acute poisoning would and did do great harm to marketing of their crops. There has been a tendency on the part of the general public to attribute to spray residue all types of food poisoning, often unfairly affecting the market for fruits and vegetables. Erroneous reports of such cases are as damaging as true ones. A false report of spray residue poisoning from broccoli at a country club in Los Angeles County published in the newspapers resulted in reduction in broccoli sales from eight carloads, on the day before the report, to six crates the following day. The Bureau of Chemistry of the California Department of Agriculture had passed to market this very broccoli when it analyzed one-fifth the tolerance allowed by law. The later obscurely published exoneration of the broccoli and the information that the poisoning was due to spoiled sandwiches did not restore the losses of the farmers, and it is estimated that this unfounded story produced a depressed market that cost farmers of California in reduced sales at least a half million dollars. We have tried to persuade newspapers to print only authentic cases of spray residue poisoning and not attribute to spray residue every stomach upset or slight fever. California newspapers now cooperate in this respect, and to do otherwise would only tend to frighten those who are adequately protected. There is no need for newspaper publicity, for the law is enforced.

Simultaneously with development of the systematic educational program, hearings were employed, which resulted in filing of criminal complaints in flagrant cases and for repeated violation. Fines and jail sentences were meted out by the court to wilful violators. To several of the more obstinate, fines of \$500 and jail sentences of 6 months were very educational. Since the Agricultural Code of California became

effective in 1933, the bureau has carried on 104 prosecutions for violation of the Spray Residue Article. With the exception of one acquittal, a dismissal, and a jury disagreement, each has resulted in a conviction. The prosecutions resulted in average fines of over \$100 and jail sentences of fifty days. The cases deserving prosecution have decreased to very few per year. This is significant when it is considered that in the great wholesale markets of Los Angeles alone, our inspection annually covers approximately 75,000 carloads of produce subject to spray residue. Growers and shippers now know that such fruits as apples and pears, and vegetables such as celery, cauliflower, broccoli, cabbage, peas, peppers, tomatoes, and sweet corn, can and must be commercially processed at origin to reduce spray residue to within legal tolerances.

In the case of certain California crops which are sent to eastern markets by the hundreds and thousands of carloads, such as pears, apples, celery, and peas, the agricultural groups concerned have initiated and borne the cost of official sampling and analysis of each carload at the shipping point, so that every car which moves interstate is certified to be within tolerance.

There always is the problem of possible metallic contamination of fruits or vegetables from sources other than spray for pest control. The bureau's system of inspection keeps this in mind. Several years ago we encountered an instance of vegetables contaminated with lead from a smelter stack. More recently, during regular routine spray residue inspection of a Los Angeles wholesale market, a sample of spinach was drawn which showed visible residue from application of nicotine sulfate-lime mixture, and in addition contained lead but no arsenic trioxide, raising the question of what lead compound was used. This prompted an investigation which

disclosed that drift from lead paint spraying of a building had inadvertently painted the surrounding vegetation as well. The bureau cooperated in making a survey of damage produced on surrounding farms. The responsible firm recompensed the various growers to their satisfaction, and this substantial acreage of contaminated produce was not marketed.

It has *not* been shown that any substance that is toxic to insects is wholly non-toxic to man, so that any spray or dust residue, even though reputedly non-toxic to man, should be fairly well removed from produce before it is marketed. Removal also meets the requirements of the consumer who is skeptical of produce on which any spray or dust residues are visible. If this has not been previously done, it should be accomplished by the housewife.

The same bureau that deals with spray residue administers the forceful Economic Poisons Article of the Agricultural Code of California. Its general enforcement for protection of users is an independent story, and involves jurisdiction over nearly 5,000 materials intended for pest control of all kinds, including those used on fruits, vegetables, and many other products while they are being grown. There have been cases of misapplication of economic poisons through mistaking an arsenical spray or dust for one that would not leave a poisonous residue. There is a regulation under this article that any content of lead, fluorine, or arsenic in any form expressed as arsenic trioxide must be stated on the label of an economic poison intended to be applied to a food crop.

A proper label is the best protection of the public with regard to the manufacturers' packages of poison. However, labels may become illegible, detached, or may be handled by the illiterate, and also there is the problem

of safeguarding against unlabeled material which has been transferred from the original package. Besides properly labeling hazardous economic poisons, such as arsenic or fluorine compounds, they should be stored under lock separately from other types of materials. Only responsible persons ever should be allowed to supervise mixing and application of economic poisons likely to produce a hazardous spray residue. Any mixing drum, duster, spray machine, or other apparatus used for economic poisons containing lead, arsenic, or fluorine should be cleaned thoroughly before being used for a less hazardous economic poison.

In some cases a label may afford inadequate protection. A manufacturer should employ every reasonable auxiliary means available for safeguarding the public. A dangerously poisonous material in so far as possible should carry its own warning. A warning may be inherent in the product, or it may be added. Aside from labeling, auxiliary means of identifying economic poisons in order of their importance are sight, smell, taste, touch, and hearing. Coloration may be an excellent supplement to labeling of poisons; a trace of a repulsive, pungent odor, in some cases might serve to warn the public; and an added disagreeable taste might prevent a person or domestic animal from eating or drinking it. The type of container has a bearing on protection. It has been suggested that the public be educated to associate with poisons a triangular, prickled or ridged bottle, or other type of protective package such as a rattle bottle cap. The important consideration in any of these auxiliary means is to make it obvious that they are poisons. All phases of this problem are now under careful investigation by the industries involved.

Before any auxiliary safeguard, such as a warning color, can be applied, a great deal of investigation should be

carried on. In selecting a protective color, solutions resembling whiskey, wine, or other beverage should be avoided. Certain insects are repelled by some colors, and also some colors may be unacceptable as food to definite species. Agricultural insecticidal and fungicidal sprays and dusts should not be impaired by requirements diminishing effectiveness. Any auxiliary safeguard may have a definite limitation, but the protection afforded by an adequate and proper label cannot be over-emphasized.

Spray residue control work comprising the inspection and analysis of fresh fruits and vegetables is carried on in California at all the principal wholesale, drive-in, and roadside markets throughout the state. The mechanism is well organized and the work well performed. Deciduous fruits with deleterious spray or dust residue in excess of legal tolerance are not allowed to be stored at points outside the district of production nor to be shipped, except under restricted permit for by-product use or for conditioning in a recognized acid-washing plant.

Any economic poisons spray or dust that will leave an over-tolerance amount of residue on any food crop should be of such composition and application that its removal can be effected before the crop is marketed. Hydrochloric acid washing of all fruits if any spray at all has been used is deemed advisable.

The mere fact that fruit may have been washed in acid one, two, or more times does not have a bearing if illegal spray residue has not been removed. The law provides that fruit and produce are unsalable unless they meet specified requirements. Quarantining of any product carrying spray residue in excess of tolerances in markets of cities and towns of California is a routine procedure. It is not sufficient for a person to be willing to recondition his product

after the presence of excessive residue is discovered on it in the market, and such disposal of quarantined products in no way relieves the person responsible for violation of the law from the possibility of prosecution. Imported fruits and produce must meet the same standards required for California products.

Except for some half dozen of probably 100 economic poisons basic materials in use or proposed, there are meager toxicological data available, and not a great deal is definitely known of the potential health hazards connected with them. Many of them are powerful agents, and the public, industry, and government have become increasingly conscious of their potential harm to consumers, workers, plants, and animals, and as a permanent contaminant of soil. When a chemical is not acutely poisonous, little is known generally as to its potentialities for chronic injury. Tolerances have been established only for lead, arsenic trioxide, and fluorine, although possibly several other substances are more or less noxious. Recently a flurry has extended beyond the steel industry as to possibility of health hazards from use of manganese. Formerly we believed this element relatively non-toxic. With its use extended from manganese dioxide dust to increased industrial purposes and to tree sprays, it has been demonstrated that the hazard is not simply due to inhalation of dust particles, but eventually there are central nervous and liver disorders.

In view of the present attention being paid to defense, conservation of human well-being is of utmost importance. The commercialization of an insecticide poison often is attempted as soon as the new toxicant has emerged from the laboratory, frequently with little or no pharmacological information. Before there is commercial exploitation and introduction into homes for inti-

mate contact with unsuspecting users, more data as to acute or chronic intoxication should be available. The determination of toxicities of economic poisons is imperative. This type of work can be carried on more expeditiously and effectively in California than elsewhere because this state uses approximately one-third of all economic poisons consumed in the United States and probably uses them in a greater variety of ways than all the rest of the states together. A Works Progress Administration project sponsored jointly by the State Director of Public Health and the Chief of the Bureau of Chemistry has been arranged for determinations of toxicities of economic poisons to be carried on at the University of Southern California. This project is comprehensive in scope and can make a real contribution to the economic poisons branch of science by anticipating industrial hazards.

Present tolerances include only inorganic substances, but some organics may hold distinct danger. All new economic poisons are examined on the basis of present knowledge as to any hazard that might exist in their use, but there may remain the possibility that a hazard be not anticipated, and that there may be unforeseen injury. Public health officials always should keep in mind spray residue, as it may account for some otherwise unexplainable illness, or help solve some particular problem that may unexpectedly appear. At the same time, one should be aware of the danger of premature and ill advised publicity.

Enforcement work must be reasonable, avoiding hysteria, and simultaneously evaluate all factors. It is unfair knowingly to exaggerate a case to the extent that people, in order to escape a hypothetical danger, will avoid sprayed products entirely, and thereby deprive themselves of valuable foods. With the continuation of careful en-

forcement, the proportion of low-residue fruits and vegetables continues to be satisfactory. Any foreign chemical substance on vegetables should be removed before they are eaten. In controlling spray residue for protection of the public, it is the duty of a health officer to protect the reputation of

produce from false report. In view of the thorough spray residue work being carried on, we will appreciate your continued conservatism in attributing illness to spray residue, for otherwise innocent farmers may be economically injured from failure to sell their produce on account of unfounded suspicion.

Milk-Borne Disease in Massachusetts 1933-1940*

ROY F. FEEMSTER, M.D., DR.P.H., F.A.P.H.A.

Director, Division of Communicable Diseases, Massachusetts Department of Public Health, Boston, Mass.

PREVIOUS chronological reports of milk-borne disease in Massachusetts have been published covering varying periods, the last in 1933.¹ The 8 years covered in the present report have been characterized by further improvements in the regulations regarding the safeguarding of milk and a further diminution in the number of milk-borne out-

the sanitary control of milk, questionnaires were sent to the 187 Massachusetts cities and towns with populations of more than 2,500. Replies were received from 166 communities, 23 of which did not give sufficient information to be included in the tabulations. The 143 communities giving satisfactory figures (Table 1) represent 90 per cent

TABLE 1
Communities Answering Questionnaire

Group		Number of Communities in Group	Number Answering Questionnaire	Per cent Answering Questionnaire	Population of Group Answering Questionnaire *
50,000 and over	(I)	16	16	100.0	2,219,593
25,000-50,000	(II)	16	15	93.3	598,630
15,000-25,000	(III)	25	24	96.0	450,255
10,000-15,000	(IV)	21	20	95.2	241,066
5,000-10,000	(V)	47	35	74.7	249,962
2,500-5,000	(VI)	62	33	53.3	112,232
		187	143	77.8	3,871,738

* 1940 Federal Census for State: 4,316,721

breaks. This low prevalence of milk-borne disease over a long period of years clearly demonstrates that the efforts expended in safeguarding this important food supply pay ample dividends.

CHANGES IN CONSUMPTION AND CONTROL

In order to learn the changes which have occurred in the consumption and

of the total population of the state.

The per capita consumption of milk has shown a slight but progressive decrease since 1926. The estimate in this report is 0.42 quarts per day, as compared to 0.44 in 1931, 0.45 in 1928, 0.50 in 1926, 0.46 in 1923, and 0.56 in 1919. There has been a progressive increase in the per cent of the population represented in the later reports, insuring a more representative estimate. These figures include only milk sold and do not take into consideration any produced for private consumption.

* Seventh Chronological Report from the Massachusetts Department of Public Health.

There has been a very satisfactory increase in the amount of pasteurized milk consumed. It will be seen from Table 2 that, since 1919, there has

TABLE 2

Per cent of Milk Pasteurized in Communities Answering Questionnaire

Massachusetts

Year	Communities Answering Questionnaire		Per cent of Milk Consumed Which Is Pasteurized
	Number	Per cent of Pop. of State	
1919	.	61.0	34.0
1923	41	65.0	74.0
1926	43	70.2	83.0
1928	95	83.0	85.7
1931	90	83.4	89.7
1939	145	90.0	92.4

been quite a steady increase in the per cent of milk pasteurized among the communities which have answered the questionnaires. The larger communities have consistently reported higher percentages pasteurized (Table 3). At the

state is now pasteurized, as compared to about 85 per cent in the previous report. Similar estimates were made by counties. As would be expected, those counties in which the preponderance of the population was urban had high percentages of milk pasteurized, while the rural counties showed lower percentages. The highest percentage was 99.8 per cent, the lowest 47.1 per cent.

One of the reasons for the marked increase in the use of pasteurized milk is that during the years which have passed since the last chronological report, the number of communities which require that all milk be either pasteurized or certified has increased from 12 to 78. The distribution of these 78 communities in the various population groups is shown in Table 4. It will be seen from this table that three-fourths of the population of the state is now contained in these communities in which milk is thoroughly safeguarded.

TABLE 3

Per cent of Milk Pasteurized in Communities Answering Questionnaire by Size of Community

Massachusetts

Group		1923	1926	1928	1931	1939
50,000 and over	(I)	82.3	91.6	93.0	96.1	99.5
25,000-50,000	(II)	65.1	63.9	84.5	89.5	95.0
15,000-25,000	(III)	43.4	35.6	61.2	80.0	85.0
10,000-15,000	(IV)	10.8	34.1	62.1	59.8	75.4
5,000-10,000	(V)	....*	....	51.9	55.3	65.0
2,500-5,000	(VI)	....†	....	....	....	58.5

* Questionnaires were not sent until 1928.

† Questionnaires were not sent until 1939.

present time there is very little milk sold in communities of 25,000 or over which is not so safeguarded. Even in the communities between 2,500 and 5,000 population more than half of the milk sold is pasteurized at the present time.

Since the figures in Table 2 represent only those communities answering the questionnaires, an estimate was made for the state as a whole using all of the information at hand. It appears that over 90 per cent of all milk sold in the

There does not seem to have been any material change in the consumption of certified milk. In 1939 it is estimated that 0.58 per cent of the total milk sold was certified, as compared to 0.6 per cent, 1.0 per cent, and 0.62 per cent for the years 1926, 1928, and 1931, respectively. The apparent increase in 1928 may very well have been due to a difference in the way in which the information was collected or interpreted. Those purchasing this premium milk at the present time are apparently doing

TABLE 4
Communities Requiring Milk to Be Pasteurized or Certified
Massachusetts
1941

Group	No. of Towns in Group	No. of Towns Having Regulation	Per cent of Towns Having Regulation	Population of Group	Population Having Regulation	Per cent of Population Having Regulation
50,000 and over (I)	16	16	100.0	2,219,593	2,219,593	100.0
25,000-50,000 (II)	16	15	93.8	623,963	586,568	94.0
15,000-25,000 (III)	25	18	72.0	474,123	331,939	70.0
10,000-15,000 (IV)	21	8	38.1	252,004	93,287	37.0
5,000-10,000 (V)	47	8	17.0	336,769	57,189	17.0
2,500-5,000 (VI)	62	6	9.7	216,362	21,170	9.8
Under 2,500 (VII)	164	7	4.3	193,907	12,975	6.7
	351	78	22.2	4,316,721	3,322,721	77.0

so not because it is raw but because it is a high quality milk, as evidenced by the fact that more than three-fourths of the certified milk sold in the state is estimated to be pasteurized.

There has been a further increase in the control of the quality and safety of milk as evidenced by the fact that the number of bacteriological examinations in 1939 averaged 10.9 examinations per 100,000 quarts of milk sold in comparison to 6.6, 5.4, and 4.9 in the years 1931, 1928, and 1926, respectively. An increase of 100 per cent in such examinations since 1928 is evidence of the interest of boards of health in protecting their milk supplies. There has been some increase in the number of boards of health which make such examinations (Table 5).

In the 143 communities which answered the questionnaire, 47 have milk

inspection work carried out by full-time employees. In some instances the same employee performs other duties for the board of health. Eighty-five of the communities have a part-time milk inspector, and only 11 have no milk inspector, 10 of these being in the communities of under 10,000 population. As would be expected, the communities with larger populations employ proportionally more of the full-time milk inspectors.

OUTBREAKS TRACED TO MILK

Because the most potent factor influencing the passage of milk regulations is usually the occurrence of a milk-borne outbreak, it seems paradoxical that the most rapid progress in passing requirements for the pasteurization of milk should have occurred in the last two years at a time of low prevalence of milk-borne disease. Part of this is due

TABLE 5
Per cent of Communities Answering Questionnaire Which Make Bacteriological Examinations

Massachusetts		1928	1931	1939
Group				
50,000 and over	(I)	94.1	100.0	100.0
25,000-50,000	(II)	63.6	61.5	81.2
15,000-25,000	(III)	63.7	76.4	71.0
10,000-15,000	(IV)	60.0	52.9	70.0
5,000-10,000	(V)	30.0	46.2	48.6
Total		57.9	65.7	68.3
2,500-5,000	(VI)	....	....	42.4
Total				62.5

* No questionnaire sent until 1939

TABLE 6
Total Outbreaks and Total Cases of Milk-borne Disease*
Massachusetts

Period	Outbreaks		Cases		Cases per Outbreak
	For Period	For Year	For Period	For Year	
1886-1890	3	0.6	104	20.8	35
1891-1895	4	0.8	224	44.8	56
1896-1900	15	3.0	308	61.6	21
1901-1905	20	4.0	410	82.0	21
1906-1910	28	5.6	2,878 †	575.6	103
1911-1915	45	9.0	4,255	851.0	95
1916-1920	32	6.4	1,287	257.4	40
1921-1925	17	3.4	444	88.8	26
1926-1930	14	2.8	1,659	331.8	119
1931-1935	7	1.4	220	44.0	31
1936-1940	4	0.8	331 ‡	66.2	83

* Includes typhoid fever, diphtheria, gastroenteritis, scarlet fever, septic sore throat and undulant fever.

† First period in which septic sore throat was included. The large figures in this period, however, are due mainly to milk-borne scarlet and typhoid.

‡ First period in which gastroenteritis and undulant fever were included.

to the continued endorsement and active advocacy of such action by representatives of the department and other public health officials, but in many instances action has been taken spontaneously because of the pressure of public opinion in the community.

The great impetus to place safeguards around milk in Massachusetts was given by milk-borne septic sore throat, which was striking one community after another in the years immediately following 1911. The use of pasteurized milk increased progressively, occasional outbreaks of milk-borne diphtheria, scarlet fever, or typhoid fever giving further

emphasis to the need for such safeguards. The large outbreak of nearly 1,000 cases of septic sore throat with 48 deaths in Lee in 1928, however, initiated the action by local boards of health to require pasteurization or certification of all milk sold. Beginning with Boston in that year, the communities in the state have one after another required that only safe milk may be sold.

As would be expected, the number of outbreaks of disease traced to milk has shown a further decrease since the last report. From the peak of 45 outbreaks in the period 1911 to 1915, which was an average of 9 per year, the last 5 year

TABLE 7
List of Outbreaks Traced to Milk
Massachusetts
1933-1940

Year	Month	Place	Disease	Cases	Deaths	Source	Milk Pasteurized or Raw
1933	Feb.	Weymouth Hingham Quincy	Scarlet Fever Septic Sore Throat	43	2	Carrier	Raw
1933	April	E. Bridgewater and W. Bridgewater	Scarlet Fever and Septic Sore Throat	57	0	Cow	Raw
1936	Jan.-Oct.	Pittsfield and vicinity	Undulant Fever	38	0		
1936	Oct.	Groton	Gastroenteritis	7	0	Infected Herd	Raw
1939	Mar.-Dec.	Petersham Gardner	Undulant Fever	35	0	Cows	Raw
1940	June	Dighton Taunton	Sore Throat	5	0	Infected Herd	Raw
				284	0	?	Raw

period (1936 to 1940) showed only 4 outbreaks, which is less than one per year (Table 6). It will also be noted that the number of cases per year has declined from over 850 to 66.

The milk-borne outbreaks which have occurred since the last chronological report are listed in Table 7. In this period only two deaths have occurred among such cases, neither of them within the last 5 year period. No cases of diphtheria have been traced to milk since 1925, and no milk-borne outbreaks of typhoid fever have been recorded since 1932. The last scarlet fever outbreak occurred in 1933. The milk-borne disease which is occurring at the present time is largely limited to streptococcic sore throat and undulant fever. It should be particularly emphasized that all of the outbreaks recorded in this report occurred upon raw milk routes.

DISCUSSION

It is encouraging to discover that the use of milk is apparently not declining appreciably. The per capita consumption is almost as high as was recorded in the years 1928 and 1931. This indicates that the people of the state have become thoroughly convinced of the value of milk as a food and continue to include it in the family diet, even in years when food budgets have been materially restricted.

That milk is one of the safest foods consumed in Massachusetts is conclusively demonstrated by the low level of milk-borne disease at the present time. This splendid record is of course due to the fact that over 90 per cent of the milk consumed is safeguarded by being pasteurized. Not only do we have a

safer milk through pasteurization, but the general sanitary quality is further guaranteed by an increase in the number of bacteriological examinations being carried on by local boards of health.

One remarkable change in trend is recorded in this report. In 1932 we were rejoicing that 143 communities, representing 85 per cent of the population of the state, lived in communities where regulations were in force requiring that all milk be either pasteurized or from tuberculosis-free cattle. Today 78 communities have regulations requiring that all milk be either pasteurized or certified, and nearly 80 per cent of the people of the state now reside in communities which have such regulations.

SUMMARY

1. Milk-borne disease continues to decrease in Massachusetts. Only 4 outbreaks traced to milk have occurred in this state within the last 5 years.

2. There has been a slight but progressive decrease in the per capita consumption of milk since 1926.

3. Seventy-eight communities, representing nearly 80 per cent of the population of the state, now have regulations requiring that all milk be either pasteurized or certified.

4. It is estimated that over 90 per cent of the milk consumed in the state is pasteurized.

5. There has been a further increase in the number of bacteriological examinations performed to guard the quality of milk.

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Wartime Protection of Water Supplies*

R. F. GOUDEY, C.E.

Sanitary Engineer, Bureau of Water Works and Supply, Los Angeles, Calif.

WARTIME protection of water supplies may be divided into three stages of precautionary measures: The first pertains to the organization of the water department itself, together with necessary precautions against wilful damage or sabotage. This problem is particularly important prior to actual outbreak of war. The second stage is to provide, in advance, a proper organization to store supplies, make repairs, and guarantee delivery of safe water against damage resulting from actual warfare, similar to the present situation in the cities of England. The third is the development of precautionary measures to take care of poisonous and war gas pollution of water supplies which so far has not become a question in the present warring countries.

SABOTAGE

Water supplies in general are exceedingly vulnerable to wilful damage or sabotage.¹ A number of cities have set up precautionary measures against sabotage, including the City of New York,² Nassau County, N. Y.,³ and the City of Los Angeles. The articles on sabotage which have so far appeared in the literature¹⁻⁵ stress the following:

1. Visitors and trespassers, including employees other than those specifically assigned, should be prohibited access to water treatment plants and reservoirs even to the point of stationing police at justified locations.

2. Affiliations and activities of every employee should be investigated, and no employee should be an alien. A person who has applied for first papers but who is lacking in progress toward naturalization should be dismissed.

3. Non-coöperative and disloyal employees should be dismissed.

4. Each employee whose business it is to enter treatment plants, reservoir sites, and pumping plants should be provided with a pass appended to which is his photograph.

5. Employees stationed at reservoirs and treatment plants should notice and report all actions of strange persons in the vicinity.

6. Reservoir watersheds should be patrolled regularly by patrol cars and local reservoirs, particularly the larger ones should be guarded with aid of motorcycles.

7. All reservoirs and treatment plants should be provided with external night lighting facilities.

8. All sportsmen should be prohibited from reservoirs and dams.

9. Airplanes should be prohibited from crossing reservoirs overhead and those doing so should be identified and reported.

10. Isolated manholes on gravity lines and treatment facilities outside of fence enclosures should be depressed, covered with sod, locked and hidden.

11. Radio communication should be established as a routine procedure through police channels.

12. Small reservoirs and all treatment works should be adequately fenced and placarded.

13. Water treatment operators should be armed and be sworn in as police deputies.

* Read before the Western Branch, American Public Health Association at the Twelfth Annual Meeting in San Diego, Calif., May 28, 1941.

14. Boats on reservoirs should be provided with night lights.

15. Chlorination should be practised at all main outlets to reservoirs.

16. More frequent bacteriological analyses should be made.

17. Health officials should coöperate with local water department officials and issue orders where practical to bring about the greatest possible conformance with these standards.

18. Where advisable, contacts with FBI agents should be established.

WARFARE PROTECTION

In England considerable preparation was made in 1939 to minimize damage from possible bombing and warfare tactics prior to the outbreak of war as reported in various issues of *The Surveyor*. The issue of January 24, 1941, states that the Metropolitan Water Board of London not only successfully maintained an adequate water supply throughout terrific bombing, but also preserved its standards of purity. Furthermore, it has not been necessary to curtail domestic or yard consumption. Experiences of other English cities are included in the Abstracts of American Water Works Literature, Defense Section, *Journal of the American Water Works Association*, Vol. 33, No. 4, pages 779-800, which mutely testify to the adequacy of prevision preparedness of the English cities.

The English writers report that high explosive bombs range from 100 to 1,000 lb. each and that protection from splintering from a 500 lb. bomb dropped 50' away requires 1½" of mild steel, 13" of bricks in cement, 12" of reinforced concrete, or 2½' of sand or earth protecting doors and windows for a vertical distance of 6'. It is further reported that bombs have struck buried 18" water lines, throwing 100 lb. sections 100' distant, and a single bomb has destroyed 600' of 48" water line. It is further reported that bombs have incapacitated buried water lines, destroyed fire hydrants, thrown building

debris on to streets which buried fire hydrants and valve boxes, caused breaks in water service connections, and have created craters exposing broken ends of water and sewer lines simultaneously.

The English practice has included: camouflaging of dams, particularly of the earth type, and reducing the high water mark by at least 5 feet; maintenance of a supply of filled sand bags on barges to repair bomb damage to earth dams; installation of valves on outlets to reservoirs in addition to the tower outlet valves; construction of by-passes around reservoirs; installation of additional valves near hydrants; establishment of better maps and records to replace the "grand old man of the department"; establishment of extra repair crews with reserve repair materials; provision of portable chlorinators, pumps and lights; provision for emergency connections between private wells and other sources of water supply; provision for duplicate sources of municipal water supply; constant repairing and checking of all valves; storage of adequate supplies of fuel and coagulants; concentration on the quick shutoff of broken house services to prevent waste and flooding of shelters; provision for by-passes around all water purification plants; camouflaging of water towers; provision for automatic closing of valves on trunk lines due to drops in pressure from bombing; ample storage of flexible screw and victaulic couplings; mobilization of plumbers who can be assigned to assist in distribution system repairs; and making of valve boxes for quick location.

Enemy action in England has tested to the utmost the adequacy of prevision and emergency actions together with resourcefulness and energy of water works officials to meet the heavy demands for fire protection and repairs to damages to the distribution system caused by warfare.

The lessons gleaned from the English experiences show that there is need of greatly increasing the number of duplicate sources of supply as well as having interconnections with different power systems and emergency Diesel engine operation. The present war year finds England spending over 5 million dollars for augmenting supplies for municipal purposes. At the present time, as indicated by announcements in *The Surveyor* and *Engineering*, the English apparently feel the need of additional personnel training in sanitary engineering as well as design engineers. Extension requests for emergency water supplies secure priority so far as public engineering defense measures in England are concerned. The principal item in wartime protection should be the maintenance of an adequate personnel to include not only repairs but design, as well as an adequate staff to control water quality. It is noteworthy that practically all news pictures showing immediate damage in England have fire streams showing that water has been continuously available for fire protection. The English practice in the sterilization of small mains has been the addition of sodium hypochlorite solutions or calcium hypochlorite powder to obtain a dose of 10 p.p.m. and hold for 15 minutes prior to flushing and subsequent use. They have also equipped every water department with portable chlorination equipment for emergency disinfection.

Emergency operation has been particularly important. It has been necessary to isolate certain areas where delayed bombs exist, to install taps at fire hydrants so that civilians can get drinking water, and to make temporary connections on the surface of the ground with temporary runarounds. In one instance, enemy bombing was so persistent on an 18" trunk line aimed apparently to interfere with fire protection in the city being bombed, that it

required one week to repair 72' of 18" line, which work would ordinarily have been completed in a few hours' time.

The Ministry of Health has ordered sterilization of damaged water mains where sewage is present prior to resumption of service; and has directed cities to notify consumers to boil water whenever breaks in the distribution system might cause sewage under a head to reach consumers due to breaks in remote but higher trunk lines before valves can be closed.

Two of the greatest public health dangers in connection with wartime damage to distribution systems is the deliberate use of the distribution system with other sources of water supply which may be polluted, for fire protection and the possibility of water mains being polluted during repairs either from ground water containing sewage or back-siphonage from buildings. During war periods there are great shifts in population as well as development of army camps, which accelerates back-siphonage conditions. At camps it is frequently necessary to shut off main lines for short times for repairs and alterations, which subjects adjacent buildings to back-siphonage conditions. There should be a definite program established to install valves which will prevent back-siphonage on large public buildings and army camps where cross-connections are known to exist. A list of such cross-connections and types of buildings where they are likely to exist is given in the article by the writer.⁶

The health officer and sanitarian must play an important rôle coöperating with water department officials in the matter of making connections with dual water supplies, in controlling back-flow and back-siphonage with suitable installation of mechanical devices and to advise on the sterilization of broken mains. All of these problems are of peacetime significance and should be

worked out even though the possibility of warfare were nonexistent.

PRECAUTIONS FROM POISONS AND GASES

While it might seem premature to take necessary steps to determine the presence of poisons and war gases deliberately added to water supplies or gaining access through war activities, there is need for the public health officer to know what the most likely poisons are, how they can be detected, and how they can be counteracted. Fortunately, up to the present time water supplies in Europe have not been involved in poisoning tactics. Nevertheless, the increasing discharge of trade wastes into sewers and streams which ultimately reach water supplies below involves many poisons which might be used in warfare. It is appropriate to give the subject serious consideration just in the matter of stream pollution alone.

Except for a few scattered hints in field manuals, very little authentic literature is available on the subject of poisons and water supply. The practice in England, in cases where poisoning might be anticipated, includes such instruction as: boiling of water if mustard gas is present to hydrolyze the gas into harmless compounds; by-passing and emptying of reservoirs containing arsine gases such as "lewisite" and diverting a portion of the supply through trout fish tanks to test the water on sensitive fish.

A study of poisons and war gases shows that there are a considerable number of substances which should be given serious consideration by public health officials. These include:

1. Arsenical compounds
2. Heavy metals
3. Cyanides, cresols, and phenols
4. Glucosides and alkaloids
5. War gases

Arsenical compounds may be either organic or inorganic, the latter being toxic in amounts greater than 0.15

p.p.m. and the former being far more dangerous. Arsenic has also been added to the newer types of war gases such as lewisite and ethyldichloroarsine which may cause death through absorption from a wound created by the gases themselves. Such gases are known as blistering gases, and even after they have hydrolyzed in water may still possess blistering characteristics.

Heavy metals include not only the soluble inorganic salts of lead, mercury, barium, copper, and zinc, but also organic substances containing metallic poisons which are far more toxic than the inorganic compounds. The heavy metals in organic combination are exceedingly toxic and are not eliminated by body fluids. They do not ionize and do not precipitate so that they can be eliminated. Hence it is important to differentiate between metals in organic and inorganic solution. An example of this is the tetraethyl lead in gasoline which is extremely poisonous.

The cyanides, cresols, and phenols similar to those in some trade wastes reaching streams are toxic at 30-60 p.p.m. and produce taste in concentrations far less.

The glucosides and alkaloids are particularly troublesome. The glucosides are saponins which sud easily and if combined with chromium and other heavy metals which are used for slime control in industrial cooling towers, are extremely poisonous. The cyanogens, glucosides, and the digitalis group of saponins are toxic at 10 p.p.m. or less.

The most common alkaloid poisons are nicotine and strychnine, although there are others more deadly. Nicotine sulfate is known as "Black Leaf 40" and is used in the control of pests. Strychnine, which is not as dangerous, is frequently used in rodent control. All alkaloids give a bitter taste to water but may be toxic at concentrations too low to taste. While many of the alka-

loids are soluble only as acid salts, there are many which remain in solution on the alkaline side. Colchicine and nicotine are freely soluble in alkaline water and their toxicity is less than 1 p.p.m.

Of the fifty to sixty war gases developed at the end of the last war, the three main groups of interest here are: (1) the arsines, derivatives of which are toxic in water solutions; (2) mustard gas; and (3) gases liberating hydrocyanic gas. The arsenical gases include adamsite, lewisite, methyl-dichloroarsine, ethyldichloroarsine, phenyldichloroarsine, diphenylchloroarsine, diphenylaminecyanarsine. Some of these gases, including the second to fourth mentioned above, are vesicant after hydrolysis. The toxicity based on arsenic is about 0.15 p.p.m. Mustard gas is toxic at about 40-50 p.p.m., but is soon hydrolyzed provided adequate dilution is available, and is therefore harmless so far as complications in water supplies and sewerage works are concerned.

From the practical standpoint, toxic doses of any of the above mentioned poisons could easily reach reservoirs or sewers. A single large airplane or a fleet of small planes could place 10 tons of material in a reservoir in a single attack. If the reservoir is of 10 million gallons capacity, then such a dose would give a concentration of 24 p.p.m. which is above the toxic limits of most of the poisons above mentioned. A reservoir so polluted might have to be emptied at once. The discharge of a reservoir so polluted into a sewer system would readily admit excessive poisonous doses into it. The deliberate addition of chemicals into the water distribution system through house services by pumps, air compressors, or steam ejectors is possible.

Certain materials if dumped in a reservoir would require long periods to mix or to hydrolyze, and their per-

nicious effects might slowly increase.

At the Sewage Works Spring Conference at Salinas, Calif., the writer suggested that the following tests be utilized in the matter of taking necessary precautions against poison from wartime activities:

TESTS ON POISONS

So far, the literature on tests for poisons has been limited to field army tests. Much literature on war gases so far as universal application is concerned, is in error because of subsequent changes in gas manufacture, difference in impurities and variance in the conditions of testing. In this new field the ordinary tests used in water and sewage treatment plants do not cover the needs of the laboratory technician. There is need, first, to understand correlations in variations of present analyses with war gas poison pollution; second, to develop qualitative tests for the detection of arsenic, mercury, and cyanide; and third, to give serious consideration to a future program for a more complete schedule of tests to cover the entire field.

1. Interpretation of Present Tests

The operator should always be on his guard to notice variations in the common tastes and not to regard abnormal variations as "flukes."

(a) *Chlorides*—The chloride determinations at sewage treatment plants vary considerably reflecting various amounts of ground water, peak sewage flow, and the discharge of industrial wastes. However, in sewages normally high in chlorides which suddenly show an abnormally low chloride content, there might have been the addition of silver, mercury, or lead. The operator should, therefore, be on the watch for an unusual variation even in this simple chloride test. Abnormally high chlorides might indicate the hydrolysis of war gases, most of which contain chlorine.

(b) *Sulfates*—If sulfates are normally present in the sewage, a low determination might be due to the addition of lead or barium salts. An increase in sulfates may be caused by the addition of copper or zinc sulfate. A few gases have sulfates as hy-

hydrolysis products, hence an increase in sulfates may be due to some war gases.

(c) *Oxygen Consumed*—Although the oxygen consumed value varies in raw sewage, any large increase may be due to war gases, glucosides, alkaloids, or phenols. This test is an immediate indication of danger and where the oxygen consumed is greater than what normally might be expected, as a normal correlation between oxygen consumed and physical appearance of the sample, suspicion of the operator should be aroused and additional tests made.

(d) *Biochemical Oxygen Demand*—Any sudden increase in biochemical oxygen demand above normal expectancy would be due to organic substances in rather minor amounts and of hydrolyzed war gas products. It is easy to see how the biochemical oxygen demand might be abnormally low in the presence of metallic poisons, glucosides, and alkaloids, and war gases if present in toxic amounts. These materials would have to be destroyed or removed before authentic biochemical oxygen demand results could be obtained, just as in the case of determining biochemical oxygen demand in the presence of free chlorine.

(e) *pH*—Most war gases hydrolyze in water and produce acid which lowers both the alkalinity and pH. In distilled water the pH may be reduced to 2.0. In reasonably good drinking water a pH of 4.0 is not unreasonable. The depression of pH in sewage because of increased buffering action would not be so marked, yet it might be measurable. Barium hydroxide in excess would cause an increased pH.

(f) *Grease*—War gases are usually dissolved in wood alcohol, acetone, or benzene, and such materials if discharged into sewers would pick up grease and cause erratic grease results in treatment plants.

(g) *Nitrates*—Since many of the heavy metallic poisons are soluble and available in the nitrate form, those plants running the nitrate determination should be on the lookout for abnormal variations.

(h) *Odor*—While not too much stress should be paid to odor because gases can be cleverly masked to conceal odor, nevertheless most gases have a characteristic odor which can never be forgotten. When once an operator has noticed a certain odor he should identify it as near as possible to its cause so that this experience can be utilized for future comparisons.

2. Introduction of New Procedures

Tentatively, a few rough tests should be instituted in addition to present determinations

including chlorine demand, a modified oxygen consumed test, and a qualitative test for metals, including arsenic.

(a) *Chlorine Demand*—It is recommended that the chlorine demand test be made on all sewage and sewage effluents regularly. Since most war gases in concentrations of 20–30 p.p.m. will produce chlorine demands of 100–200 p.p.m., it is evident that the chlorine demand test modified on this basis is able to pick up minor quantities having significant value.

(b) *Oxygen Consumed Test Modified*—Small quantities of war gases produce high oxygen consumed values and are immediately oxidized. It is suggested that the digestion period be reduced to 5 minutes.

(c) *Heavy Metals and Arsenic by Hydrogen Sulfide Precipitation*—Such a test might include: first, evaporating to dryness 500 ml. of sewage in sulfuric and nitric acid until the solution is practically colorless; and second, the dilution of the residue with water, and finally precipitation of the heavy metals with hydrogen sulfide. If heavy metals are present, there will be variously colored precipitates. A whitish precipitate of sulfur may obscure the yellowish precipitate of arsenic in quantities roughly below 10 p.p.m., but in larger concentrations arsenic is readily noticed.

(d) *Arsenic in Quantities Less Than 10 p.p.m.*—The best tentative arsenic test including inorganic arsenic and organic arsenicals is good to 1 p.p.m. if the original sample is concentrated 10 to 1. To 100 ml. of sample is added 5 ml. of concentrated sulfuric acid and sufficient concentrated nitric and hydrogen peroxide to decolorize. The sample is heated to SO₃ fumes in a Kjeldahl flask. The residue is dissolved in distilled water and reduced with 0.1 gm. of hydrazine sulfate followed by boiling till sulfur dioxide has been completely removed. After cooling, neutralize with sodium carbonate, add 30 ml. of water and 0.2 gm. potassium bromide and 5 ml. of concentrated hydrochloric acid; follow by titration with 0.01N KBrO₃ using methyl orange indicator. The titration is to a disappearance of color with continued additions of methyl orange.

This test is a good qualitative procedure and quite accurate quantitatively. For more precise results the Chaney method is preferable.⁷

(e) *Spectrograph*—The spectrograph is the quickest and easiest method to determine the presence of abnormal amounts of all heavy metallic poisons in extremely small amounts. It is also useful in the detection of arsenic but is not sensitive below 1 p.p.m. Spectrographs are now available in forensic labora-

tories in leading police departments, at leading universities, and in a few progressive sanitary laboratories. Such equipment should be used where convenient.

While it is recommended that the present laboratory tests made by the operator should be watched for the variations above indicated and be correlated to possible additions of metallic and war gas poisons, the writer is of the firm opinion that the other tests above mentioned should be adapted for immediate use. This is recommended not only as a preparedness measure but because of the additional value of such information being readily adapted to practical use so far as the disposal of trade wastes into sewers is concerned.

The health officer and sanitary inspector in health departments should at once institute a threefold program:

First—All water departments should be encouraged to adopt recognized methods in the control of sabotage as recommended in this paper which constitutes the recognized practice by leading cities throughout the United States.

Second—It should recommend that water departments, in the event warfare appears imminent, adopt all of the measures reported herein which are designed after the experience

in Great Britain and, further, should initiate an active program to install protective devices on all public buildings, hotels, restaurants, food preparation establishments, industrial plants, and in camps where cross-connections are known to exist.

Third—Every health officer and sanitary inspector should be fully aware of all possibilities of poisoning water supplies by the different means enumerated in this paper and make the best use of present tests with the addition of other tests, if necessary, to be able to advise water departments what to do in the event that their water supplies are poisoned. The health officer will find that most water superintendents are ready to comply with the standard practice in the best cities in the United States which is based on that found necessary in Great Britain and closer coöperation should be effected even though war does not appear imminent.

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Facts and Fancies About Food Fats

A. J. CARLSON

Department of Physiology, University of Chicago, Chicago, Ill.

AMERICA is entering a new era. At this time when we are engaged in an "all-out" effort for defense, industry is being geared to produce the weapons of destruction at all possible speed; and men are being trained to use these weapons. Such defense preparations for the destruction of human life are necessary, if and when we go to war.

Yet there is another defense program of a more civilized aspect and of longer standing, now receiving more serious national attention—a program which has as its main objective the preservation of life and the improvement of health. I refer to our awakened and united concern for a more adequate diet and a better nutrition for all the people. It is time that we face the facts about foods, spread the truth, the whole truth, and nothing but the truth, and liquidate the mistakes of the past.

Every thoughtful citizen should be concerned with the ignorance prevailing among our people regarding the nature of foods and what is an adequate diet and a good state of nutrition.* He should be concerned with the poverty which prevents millions of our fellow

citizens from obtaining an adequate diet, even when knowledge of what constitutes an adequate diet is present. He should also be concerned with the large amount of misinformation as to foods, by direct statements and by innuendo, that is being spread abroad in the land through advertisements. To my way of thinking, food advertisements, local or national, could and should be in the interest of true adult education in the matter of diets and nutrition. The large sum of money annually spent on advertising of foods comes ultimately, like all money, from the producers and the consumers. Should we not, as a people, use this large sum of money as a public trust? Food advertising, as adult education, should be as informative and as accurate as we strive to make other forms of education. It should be made so by the food producers, large and small, rather than by local and federal legislation. The attempt at control of crude and artistic lying by the Federal Trade Commission appears a too cumbersome and inefficient method in a republic of intelligent, informed, and patriotic citizens. I believe that once this situation is called to the attention of our food producers and food distributors, their own sense of public duty will promptly result in voluntary organization on their part leading to elimination of present unseemly practices.

As an example of misleading information in food advertising, we could cite the frequently used term of "health

* "The discrepancy between current popular diets and the type of diet that our present knowledge of foods and nutrition would recommend seems to be due to several factors: food habits, some old, some new; lack of appreciation of the importance of an adequate diet; inadequate knowledge of food needs and food values in relation to cost; inadequate purchasing power; and, in the case of rural families, an inadequate food production program designed to complement food purchases." Hazel K. Stiebling, *Food and Life*, U. S. Dept. Agr. Year Book, 1939, p. 130.

food." As if every food was not a health food for the normal man, woman, or child, if we eliminate the few individuals with special food idiosyncracies. The word "pure" is also frequently so applied in food advertisements as to mislead the uninitiated. For the purposes of human nutrition, every food is pure, when no injurious ingredients have been added in the processes of manufacture, storage, or distribution; when no spoilage or deterioration has taken place; and when no element of dietary importance has been removed from the materials produced by nature. Many troubles due to defective diets started with man's ingenuity in "purifying" and storing foods. We should remember that during the greater part of man's past he has survived and prospered, in the matter of foods and diets, subsisting essentially on the natural unpurified, non-processed foods, and guided in the kind and quantity of diets by the bodily needs as expressed in the natural urges of hunger and appetite.

Our remote ancestors probably ate whatever they could get. And our recent information of the chemistry of foods, and the specific food requirements for health, indicates clearly that there is a large factor of safety in human nutrition by including in our diet both animal and vegetable foods, that is, by being omnivorous. The story of the exclusively vegetable-eating, or herbivorous, and the exclusively meat-eating, or carnivorous animal species goes to prove that all the ingredients in fats necessary for health can be adequately secured either from animals or from plants. From necessity and from choice, man has been omnivorous for a long, long time. As long as only a small percentage of our population is strictly vegetarian, or abstains from foods from particular animal species, on esthetic or religious grounds, this raises no serious problem in national nutrition, although, to a physiologist, it seems very unwise

for normal people to avoid such high grade and common foods as meats, eggs, milk, butter, and cheese. Should a majority of our population ever refuse foods of animal origin, we would have to institute human birth control in earnest, liquidate preventive medicine, start eating grass, or pray for death control through pestilence and war, because without the animal conversion of the grasses on the land, and other vegetations in lakes and seas there would be shortage of food, even for the present human population on the earth.

Another error fostered by published statements about some foods is that the color of white, or whiteness, in such foods as flour, bread, fats, etc., is an index of purity and superior wholesomeness of these foods. Nothing can be further from the truth, as a general proposition. A few natural foods, and some chemically separated, or processed, food elements may be transparent when in solution and hence be colorless. But practically no natural food is white. And there is no evidence that the natural colors of foods are harmful factors in human digestion and nutrition.

Even more reprehensible misstatements occur in connection with the advertisements of the edible vegetable and animal fats, and food products manufactured through various processings of these fats. For example, vegetable oil shortenings are sometimes described as "creamy smooth," as "triple creamed" which, to the average layman, may suggest cream. Some vegetable oil shortenings are labelled "the digestible shortening" and described as "easy to digest," suggesting to the average layman that other shortenings are not digestible or at least not so easily digested. Still another vegetable oil shortening, besides advertising "purity" and "wholesomeness," conveys the innuendo of unpleasant or unwholesome odors in animal fat shortenings by the statement: "adds no flavor of its own."

The word "pure" is most frequently applied in such a way as to suggest that similar articles of food made from other fats are less pure. The particular sinners here appear to be some of the vegetable fat manufacturers. In advertising these vegetable fat products, the term "containing no animal fat" is frequently so played up as to suggest that similar products made from animal fats are not pure or are less pure, less wholesome, and less digestible. One product offered cash prizes "for the most English words made with the letters in the slogan 'contains no animal fat.'" One vegetable oil shortening advertises "purity" and freedom from "smells" in such a way as to imply that impurity and bad smells adhere to other makes of shortenings. Again, in advertising, the terms "digestible," "pure vegetable," and "energy giving" are associated in such a way as to suggest that vegetable fats are more pure and more digestible and energy giving than are the animal fats. In fact, one of these shortenings is advertised as having "miraculous digestibility"! Another is said to "digest easily," which implies that other shortenings digest less easily.

In this connection I cannot refrain from recording my disapproval of the consequences of the trade fight of the dairy industry on the producers of wholesome margarines, whether these be mainly made from vegetable oils or from vegetable oils and animal fats, for this is a fight on our fellow citizens with the lowest income. The dairy industry can and should stand on its own feet, as it produces some of the finest and most valuable foods for man: milk, butter, and cheese. But, to my way of thinking, it is unpatriotic and short-sighted of this industry to place an additional economic burden on the lowest income group in our nation. For the nutritional welfare of the people in the lowest income group we should not step up the

price of the margarines by special taxes. These people would be better off in health by buying and eating two to three pounds of good margarines at about the price of one pound of winter butter. For such a wholesome food as good margarines can be produced and distributed at a lower cost than butter, and can be so fortified with the vitamins normally occurring in butter as to be practically equivalent in nutritive value to butter. What difference does it make to human nutrition whether vitamin A or the pro-vitamins A are added to an animal fat like butter by the physiological processes of digestion, absorption, and milk secretion of the cow or goat, or whether these same vitamins or pro-vitamins, all of them produced by the vegetable kingdom, are added to other animal or vegetable fats by the growing ingenuity and chemical skill of man? In my judgment, this fight and the laws, state and federal, resulting therefrom, are not in the interest of adequate national nutrition and national defense.

Sherman (1937) estimates that one-fourth to one-third of the energy in the American and European diets comes from the fats in the food. Langworthy puts the fat eaten daily by American adults as around 5 oz.—7 oz. of fat per day being the maximum that the average human adult can digest and absorb with ease. But the amount of fat a person can, with comfort, take in daily depends on the individual, on the amount of physical work, and on the rigor of the climate, as in the case of the Eskimos. I have seen Finnish lumberjacks in northern Michigan consume well over a pound of boiled pork at one meal, at least half of it being pure fat, without disturbance of the digestive processes.

An ounce of reflection on the part of every informed adult citizen ought to bring out the fact that some natural fats are present in every natural food

for man, be this food of animal or of vegetable origin, and that during the greater part of man's history there was practically no refinement or purification of foods. So when our forefathers, for a million years or more, consumed fruits, cereals, nuts, raw vegetables, eggs, fish, fowl, or flesh, they consumed at the same time varying amounts of vegetable and animal fats. Thus, without knowing it, as the discovery of the essential fatty acids and the importance of choline is of very recent vintage, man of the past obtained at least the necessary minimum of these food elements.

Fats almost identical in composition, digestibility, and energy value are not necessarily equal in the quantity of vitamins carried by the fats. Practically all natural fats separated from their normal association with the proteins and the starches of the plant or the animal, carry accessory substances giving color, flavor, and odor to these fats. Whether such flavors or odors are pleasant or unpleasant to man depends largely on the intensity of these flavors and odors, as well as on our past dietary habits. For example, the relatively small amount of oil in a boiled, baked, or fried codfish, mackerel, or trout, is to most people not unpleasant either in flavor or odor. But fish oils by themselves may be disagreeable to the same palate and the same nose.

The animal and vegetable fats in foods, and as foods, constitute a special and a huge problem in the food industry, in food economics, and in our daily diet. Per calory the animal and vegetable fats rank, by and large, as one of our least expensive energy foods. At the same time, there is probably greater loss and wastage of fats than is the case with the proteins and the starch of our dietary—loss through rancidity, waste in cooking, and waste at the table. Much of this waste is avoidable, and this avoidable waste is inexcusable in

the face of the undernutrition in our own land, not to speak of the starving millions across the seas.

The basis for the above statements of facts and the plea for truth in all statements about food is contained in the following digest of our present scientific information on the chemistry of the fats, and the rôle of the fats in nutrition. This digest is further briefed in a summary of conclusions beginning on page 1189.

1. THE FATS IN THE DIET FURNISH CONCENTRATED ENERGY FOR THE WORK OF THE BODY

The numbers of calories, or energy, obtained on oxidation in the body of the three main classes of foods were reported by Rubner in 1901. A gram of carbohydrate produces 4.1 calories. A gram of protein also yields 4.1 calories. A gram of fat yields from 9.1 to 9.3 calories of heat or energy. The fats are, clearly, the most concentrated foods, from the standpoint of energy.

Another advantage of the fats as a source of energy for the body lies in the fact that the fats have a relatively low specific dynamic action. Specific dynamic action of a food is the percentage of its available energy dissipated, after ingestion, in raising the heat production in an individual, irrespective of body needs, above the level found in the fasting and resting state. According to Lusk, for every 100 calories of protein eaten, the heat production is increased 30 calories above the basal level. For 100 calories of carbohydrate (starch) ingested, the heat production is increased by 4.9 calories, and for every 100 calories of fat, the heat production is increased by 4.1 calories above the basal level. Other figures indicate that the specific dynamic action of fat is more variable, but it is always well below that of protein. But the energy needs of the individual cannot be completely met by the ingestion of fat, since it seems necessary that

some carbohydrate be metabolized at the same time as the fat, in order that the acid metabolites derived from the fats may be nearly completely oxidized.

Carbohydrates, and also part of the protein ingested in excess of current body needs for repair and growth, can be and are converted into fat and stored in this form, so that the body is not entirely dependent on the ingested food fat to form its stores of body fat.

2. THE FATS ARE THE ONLY SOURCE OF THE ESSENTIAL FATTY ACIDS

Certain natural fats serve as the source of essential fatty acids. Fats and oils consist of the tri-hydric alcohol, glycerol, having the formula $C_3H_8O_3$, combined with certain higher fatty acids, such as butyric acid ($C_4H_8O_2$), caprylic acid ($C_8H_{16}O_2$), oleic acid ($C_{18}H_{34}O_2$), or linoleic acid ($C_{18}H_{32}O_2$). The latter two are both unsaturated acids, so-called, because they can take hydrogen at linkages between carbon atoms where there are double bonds. Stearic acid is a saturated fatty acid, $C_{18}H_{36}O_2$, and cannot take up such elements as hydrogen.

Burr and Burr (1929, 1930, 1940) have shown (on rats) that unless small amounts of certain fatty acids are present in the diet, a dietary deficiency disease is produced. The symptoms include scaly and inflamed skin, cessation of growth, kidney disorders as shown by the appearance of blood in the urine, and impairment of reproduction. Finally there is decline in weight, followed by death. The natural fats and oils which were found to prevent or cure this deficiency disease were corn oil, linseed oil, olive oil, and lard. Between 5 and 15 drops of these fats daily, fed to the individual rats, was all that was necessary to cure the deficiency symptoms described above. Butter and coconut oil when fed to the deficient rats in amounts of 15 drops daily per rat permitted but little growth (10 to 20 gm.

in 50 days) and did not cure the scalliness of the skin. This apparent deficiency of the essential fatty acids in the milk fat of cows does not seem to square with the absence of the symptoms of such deficiency in infants fed for months almost exclusively on breast milk or cows' milk. Such a diet is known to produce anemia, due to too little iron in the milk. There may be considerable stores of essential fatty acids in the body of the new-born mammal, or the content of essential fatty acids in human milk fat is higher than in cows' milk.

On studying the composition of the natural fats which had these curative effects, it was found that the fats having large amounts of the unsaturated fatty acids, linoleic, linolenic, or arachidonic acids, brought about the greatest improvement in growth and in recovery of the skin, when fed to rats which had developed the deficiency symptoms on a fat free diet. Coconut oil and butter, which (in the amount fed) did not cure the deficiency symptoms, contain little of the three unsaturated fatty acids named above.

The work of Burr and Burr showing the need for certain unsaturated fatty acids in the rat diets has been confirmed and extended by several investigators. Evans and Lepkovsky (1932) showed that the rate of growth of rats fed a diet including butter, lard, or the liquid fats of coconut oil, which contain both saturated and unsaturated fatty acids, was three or four times the rate found in rats fed a diet containing only saturated fatty acid as the fatty material in the diet. Evans, Lepkovsky, and Murphy (1934) also reported that reproduction was not normal in rats unless the essential unsaturated fatty acids were added to the diet. On a diet free or nearly free of fats, degeneration of the testes occurs. Hume and coworkers (1940) found arachidonic acid most important for growth, while linoleic acid

was most significant for the health of the skin.

3. THE FATS APPEAR TO HAVE A SPARING ACTION ON THE B VITAMINS

Birch (1938) studied the interrelation between the essential fatty acids and vitamin B₆ in the nutrition of rats. He found that:

... rats may develop the acrodynia-like dermatitis if the diet is free from fat, even when moderately large amounts of vitamin B₆ are given. . . . Even with 10 times the minimum curative dose (of B₆), unsaturated fatty acid is necessary for normal health and growth. . . . The amount of B₆ ingested by the rat appears to determine the kind of dermatitis which is to develop. When ten minimum doses of vitamin B₆ are fed, the symptoms found are similar to those described by Burr and Burr (1932), (dandruff, loss of hair, sores on skin). When only 2 to 5 times the minimum dose of vitamin B₆ is fed, the acrodynia-like dermatitis appears. These results would indicate that the function of vitamin B₆ and the unsaturated fatty acid factor in the animal body are closely connected.

Birch not only fed diets free of fat, containing varying amounts of vitamin B₆, but he reversed the conditions of the experiments and fed diets free of B₆, containing varying amounts of natural fats, i.e., lard and linseed oil, which are rich in the essential unsaturated fatty acids. Onset of skin symptoms occurred in 3 to 4 weeks, when no fat was fed, in 6 to 7 weeks with 5 per cent lard in the diet, in the 8th to 14th week with 10 per cent lard in the diet. Growth was poor in all cases, since the rats gained only 20 to 30 gm. after being 100 days on the diet containing 20 per cent lard and no vitamin B₆. It may be concluded that the inclusion of lard or linseed oil delayed the onset of the typical dermatitis due to lack of vitamin B₆. When butter was fed as 9 per cent of the diet, instead of lard or linseed oil, the resulting skin symptoms were more severe than with the latter fats. Butter has only small amounts of the

essential unsaturated fatty acids. The supplemental action of vitamin B₆ and the essential fatty acids has also been shown by Salmon (1940), who reports that both are needed for normal nutrition.

Fats have been found to have a sparing action on vitamin B₁, and this action is not limited to the essential unsaturated fatty acids. Evans and Lepkovsky (1932) fed three different levels of vitamin B₁ (brewers' yeast) to different groups of rats varying from 50 mg. to 800 mg. daily. At each level of yeast there was better growth with at least 9.7 per cent fat (lard) in the diet, than with a fat free diet. It is possible that the added fat gave added increments of essential unsaturated fatty acids, since these were not provided otherwise in the diet, except as they were found in the 2 drops of cod liver oil fed each rat daily, or as traces in the casein. These authors also present evidence (1934) supporting the view that high levels of vitamin G and protein are necessary for the sparing action of fats on vitamin B₁. Arnold and Elvehjem (1939) found that when the fat content of the diet was increased to 56.5 per cent by *isocaloric* replacement of the sucrose of the initial diet with lard, the thiamine requirement of dogs was decreased to approximately one-third of the former level. The thiamine requirement may best be stated as 75 micrograms of thiamine chloride per 100 gm. of the non-fat constituents of the diet. The authors declare that "the isocaloric substitution of fats for carbohydrate in the diet is a nutritionally sound procedure. Assuming the initial ration is balanced, the balance is necessarily retained even when large amounts of fat are substituted for the carbohydrate in the diet."

4. THE FATS ARE THE CARRIERS OF VITAMINS A AND D

The fat soluble vitamins A and D,

are found in greatest concentration in fish liver oils. McCollum, *et al.* (1939) gives the number of international units of vitamin A per 100 gm. of cod liver oil as 100,000 to 250,000, and of vitamin D, 8,500 to 25,000. Among the natural fats and oils commonly used for cooking and other purposes in our daily diet, summer butter is the richest source of these two vitamins. The vitamin A content of butter ranges from 1,000 to 8,500 I. U. per 100 gm. and the vitamin D content ranges from 40 to 150 I. U. per 100 gm. The vitamin A content of butter varies with the breed of cows and with the season of the year. Booth, *et al.* (1934) found values (biological assay on rats) which varied from 8,500 units per 100 gm. in summer butter to 4,000 units per 100 gm. in winter butter. Bauman, Steenbock, *et al.* (1934) made spectroscopic determinations of carotene and vitamin A content of butter fat from cows of different breeds on high and low carotene diets. On winter rations, butter from Guernsey cows gave 5.1 micrograms of vitamin A per gm., and butter from Holstein cows gave 10.1 μ_{gm} of vitamin A per gm. of butter. On fresh green feed rations, the figures for Guernsey and Holstein butter were respectively 8.5 and 15.1 μ_{gm} of vitamin A per gm. The individual variations between members of the same breed on the same diet were as great as 100 per cent.

Natural fats and oils, other than fish liver oil and butter have in general smaller amounts of vitamin A and vitamin D. An exception to this is found in the report of Kon and Booth (1934) that samples of American lard contained as much vitamin D activity as samples of summer butter. The reports on vitamin A content of lard are conflicting. Daniels and Loughlin (1920) concluded that if large enough amounts (28 per cent) of lard or cottonseed oil were fed to rats the animals received adequate amounts of these fat soluble

growth promoting vitamins. Mallon and Clark (1922) fed rats a similar diet containing 30 per cent lard, with 0.6 gm. yeast, as the daily supplement. The authors concluded that there was not sufficient vitamin A in the lard to prevent severe vitamin A deficiency. On the other hand, Drummond, *et al.* (1920) concluded that there are appreciable amounts of vitamin A in the body fat of pigs fed a high vitamin A diet. They support the view that loss of vitamin A in lard is due, not to the high temperatures of rendering, but to stirring or otherwise oxygenating the lard with resulting oxidation of the vitamin A. The evidence indicates that lard as marketed contains little or no vitamin A but may contain vitamin D equal to that found in butter. The fat of beef has been found to contain some fat soluble vitamins. Fetter and Carlson (1931) reported that, as tested on rats, an oleo oil-lard-milk margarine was equal to butter in vitamin A content and superior to butter in vitamin D content.

McCollum, *et al.* (1939) states that corn oil and cottonseed oil contain no vitamin A. But according to Sherman (1937) yellow vegetable oils, such as olive oil, yellow palm oil, and maize oil, may contain appreciable amounts of this vitamin. Vegetable fats which have been hydrogenated or drastically refined are devoid of vitamin A.

Recent investigations indicate that fats in the diet probably influence the effectiveness of vitamin D in preventing and curing rickets. Jones (1940) showed that addition of 5 per cent to 25 per cent lard to the synthetic rachitogenic diets had definite antirachitic action. The lard increased calcification on diets containing large (1.1 per cent) or moderate (0.38 per cent) amounts of calcium. The effect of the lard was less pronounced on diets very low in phosphorus than on diets higher in phosphorus. The author believed that the fat acted in some manner to increase

calcium and phosphorus absorption, possibly through furnishing a more acid reaction in the intestine.

Insufficient fats in the diet will impair growth and induce serious injuries in the liver and the kidneys, through insufficiency of one of the components of most fats, namely choline. Recent investigations (Best and Ridout) show clearly that, apart from the energy or calory factor, choline is as necessary in the diet as are the essential fatty acids and the fat soluble vitamins A and D.

5. THE SPARING ACTION OF FATS ON PROTEINS

Nitrogen equilibrium is the state in which the amount of protein in the diet equals the amount of protein broken down in the body. It is important for health to protect the body proteins from serious depletion by having the amount of protein in the diet adequate for the requirements of protein metabolism, all the cell protein being destroyed in the body thus being regularly rebuilt from the food proteins. Much less protein is needed in the diet to maintain nitrogen equilibrium when fat or carbohydrate foods are eaten with protein than when the diet is largely protein. This is due, at least in part, to the fact that, when protein is eaten alone, it must supply all of the energy needs of the body as well as furnish the protein needed for growth and repair of body tissues. In the matter of energy the fat in the diet can replace a large part of the starches and proteins in the diet, and during a period of underfeeding or starvation, the body fats are drawn on, and less body protein is destroyed or burned than would be the case if no fat had been stored in the body. As mentioned above, the specific dynamic action of fat is considerably lower than of protein, so that less excess heat is produced when fat in the food, or fat from body stores, is metabolized, with the protein.

6. IN GENERAL, THE NATURAL FATS IN FOODS INCREASE THEIR PALATABILITY

Butter has long been one of the table fats used by many European and American peoples as a flavoring for vegetables, creamed dishes, and desserts. Olive oil has been used by the Italian people to flavor their foods. The flakiness imparted to pie crust and crackers, and the characteristic texture of cakes and cookies, imparted by lard and vegetable shortenings, as well as the flavor imparted by the fat, do much to enhance the palatability of the food containing it. The factor of palatability is of no small importance in insuring an intake of necessary types and amounts of foods. This is illustrated often with children. The palatability of the food can play an important part in insuring that new dishes are enjoyed, or adequate amounts of vegetables are eaten. Enjoyment of food, in turn, promotes good digestion through the enhancement of the flow of digestive juices, and normal digestive motility of the alimentary canal.

The flakiness or crispness imparted to such foods as pie crusts, cookies, and cakes by fats is also spoken of as the "shortening power" of fats. When variations in the baking art of the individual are eliminated the "shortening power" of the different fats may be measured by determining the force required to break the cookie or the pie crust. Using such methods, Fisher (1933) found, on the average, a 25 per cent difference in the shortening power of such food fats as lard and hydrogenated cottonseed oil, lard having the highest and the cottonseed oil the lowest. But this is a culinary problem, not a nutrition problem, except to the extent that flakiness and crispness increase palatability, thus favoring digestion, and may tend to decrease wastage of foods. And variations in the art of baking seem as important as the kind of fats employed for "shortening"

(Lowe, Nelson and Buchanan, 1938).

Fatty foods leave the stomach more slowly than carbohydrates or proteins. In susceptible persons, or after the ingestion of very large amounts of food, this may cause a feeling of increased weight or heaviness. On the other hand, lengthening of the stomach emptying time by the fats in the food may lead to a desirable sense of comfort and satisfaction. The energy requirement may be adequately supplied by carbohydrate and protein, yet since they leave the stomach rapidly, the hunger sensation may return too quickly and lead to over eating.

7. THE COMPARATIVE DIGESTIBILITY OF FATS

U. S. Department of Agriculture *Bulletin 310* presents results on a study of the digestibility of various food fats. "Digestibility" of a fat refers to the amount of the ingested fat which is assimilated. Values were determined from the amount of fat eaten by the subjects and the amount of fat excreted in the feces. The results show that the common dietary fats and oils such as butter, lard, cottonseed oil, hydrogenated cottonseed oil, cream, etc., are about equally well digested, the amount retained by the subjects ranging from 96 per cent to 98 per cent of the fat eaten. Fats of somewhat lower digestibility are mutton fat (88 per cent digested), and oleostearin (80.1 per cent digested). The latter is a hard fat of high melting point found in fat around the beef kidney. The relation between melting point and digestibility of a fat was pointed out in the Department of Agriculture studies, butter, melting at 32.0° C., was 97.0 per cent digested. Lard, melting at 35.0° C. was 97.0 per cent digested, while beef kidney fat, melting at 45° C. was 93.0 per cent digested, and mutton fat, melting at 50.0° C. was 88.0 per cent digested. Drummond tested the digestibility of

lard and lard substitutes and found that neutral lard, hardened cottonseed oil, and lard compounds, with melting points of 40.0° C. or less, each had a coefficient of digestibility of between 96.0 per cent and 98.2 per cent. The experiments of this author, and those previously cited, indicate that the fats and oils which are in common use as foods are all of high and practically equal digestibility, only mutton fat and the stearin of beef kidney fat showing slightly lower digestibility. Most of the animal and vegetable fats are well tolerated by normal adults in amounts ranging from 80 to 150 gm. per day, but the beef kidney fat, goose fat, and olive oil appear to have a laxative effect when eaten in quantities of this magnitude, though they can be eaten with no disturbing results in amounts less than 80 gm. per day.

All the scientific data on the digestibility, flavor and color of the dietary fats show clearly that there is no significant difference in digestibility between animal and vegetable fats, and that the acceptability of these fats in regard to color and flavor is a matter of past conditioning of the individual and of no other significance in nutrition.

SUMMARY OF CONCLUSIONS

1. Natural fats are almost universally distributed in animal and plant materials fit for, and used as, food for man. These animal and vegetable fats, when liquid or nearly liquid at the body temperature of man, are equally digestible and available for the energy needs of the body.

2. The natural fats (animal and vegetable) differ in the amount of vitamins A and D dissolved in these fats. Fish liver fats and summer butter carry the highest concentration of vitamin A of any food fat, unless vitamin A concentrates from other sources have been added. Rancidity, and various manufacturing processes, employing temperatures much above that of the mammalian body and affording increased rate of oxidation, decrease or destroy the vitamin A, natural or added, in fats.

3. A minimum of fats in the diet is necessary for health and life. The known factor

or factors are the essential fatty acids, choline, and vitamins A and D. But, in all probability, this is not the whole story of the indispensable rôle of the fats in human nutrition. While the essential fatty acids are widely distributed, but in varying percentage, in the animal and plant fats, the widest variety of foods are clearly a factor of insurance of safety and health as regards these indispensables. Such processings as hardening (hydrogenation) of the more liquid fats so change the essential fatty acids that, though still useful as a source of energy, they can no longer perform their specific rôle in human life and nutrition.

4. Except to the extent that individuals, through teaching and habit, are conditioned to prefer, or dislike, the specific color, odor, and taste of the natural fats, these elements in the fats have no known significance in nutrition, except that the yellow color in natural fats may be a rough measure of the concentration of the pro-vitamins A.

5. The food fats, be they of animal or plant origin, not immediately used in the energy processes of the body, are altered to the characteristic form of the body fats of the species, and stored in the fat depots as energy in reserve, against days of food scarcity and disease. But adiposity or excessive weight, *per se*, is not an index of excessive fat consumption, as excess starch and excess proteins in the diet also add to stored body fats. We have indications, in rats and men, that both depletion and overabundance of the fat stores of the body, either as a symptom or as an essential link in the life process, are both unfavorable to human health and longevity.

6. The arts of food processing and food refining, food preservation and storage, cooking and baking, have in the past grown, like Topsy, through human ingenuity, driven by real and fancied needs, to satisfy the human palate, the human nose, the human eye, and the pocketbook of the individual, rather than to meet the essential needs of human nutrition. We now have a sufficient body of reliable information on the fundamentals in the nutrition of man to guide these arts by

adult education based on facts and reason. To pursue any other course from now on seems unscientific, nationally short-sighted, and a disservice to the most fundamental needs of man. So why not combine all our forces for a steady pull on this oar?

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Staphylococcus Enterotoxin: An Improved Cat Test, Chemical and Immunological Studies

WILLIAM McD. HAMMON, M.D., DR.P.H.

*Department of Preventive Medicine and Epidemiology, Harvard University
Medical School and School of Public Health, Boston, Mass.*

AN attempt has been made in the studies here reported to evaluate the biological tests recommended for the detection of the presence of staphylococcus enterotoxin and to simplify and standardize the interpretation of the most reliable of these. At present most health department laboratories find it impractical to test for this very common food poisoning substance because of inherent difficulties of the available tests and the almost complete lack of knowledge regarding the chemical nature of the toxin and of how to extract it from suspected foods. When it was felt that the criteria for a reliable, inexpensive, practical and highly specific test had been met, by means of which preliminary studies were made of the physical, chemical, and immunological properties of the toxin.

QUALITATIVE TESTS

Since Dolman, Wilson, and Cockcroft¹ described the intra-abdominal kitten test, other *in vivo* tests have been abandoned to a large degree. Man, although probably the most susceptible of all animals, for obvious reasons is now seldom employed. Monkeys have been extensively used but data have been accumulating which indicate that these animals have relatively low susceptibility, show great

variation in their response, and give occasional false positive reactions.²⁻⁵ In our experience monkeys have proved very unsatisfactory and perhaps the greatest single objection lies in the fact that they are not readily available to many laboratories.

Dolman Kitten Test—

The kitten test as described by Dolman and his associates¹ involves the injection of specially prepared culture filtrates into the abdominal cavity of very young kittens (250–500 gm.) after inactivation of the lethal exotoxins by heat, formalin, or neutralization by specific antitoxin. After a variable period of time, toxic filtrates will produce vomiting and diarrhea. These workers indicate that the same kitten may be used repeatedly within limits, and Dolman and Wilson⁶ set these limits at 7 to 10 days, explaining that after a period of 2 to 3 weeks a significant degree of immunity may develop. Kupchik,⁷ although confirming the usefulness of the test, believes that an animal should be used a second time only after a period of 2 weeks has elapsed. Rigdon⁸ and Jones and Lochhead⁹ report nonspecific reactions following the inoculation of control materials.

During the early phases of this work

false positive reactions and the rapid resistance gained through previous inoculation presented severe difficulties, but before abandoning the method an experiment was planned to determine if possible the chief factor responsible for the rapidly developed tolerance. It was suspected that peritoneal irritation produced the nonspecific vomiting and diarrhea and, if this could be incriminated as playing a rôle in the development of resistance, the route of inoculation should be abandoned, but not necessarily the animal.

A group of 7 previously unused kittens all weighing about 1,000 gm. were inoculated intra-abdominally at intervals of 2 days with various materials in equal amounts by weight; these were: known enterotoxic filtrate,* filtrate

from known nonenterotoxigenic strains of staphylococci* identically prepared, uninoculated sterile infusion broth similar to that used for toxin preparation, and infusion broth containing 0.3 per cent formalin (Table 1). All cats were tested at the end of the experiment (fourth inoculation for most animals) with the enterotoxic filtrate, together with 2 new control animals. Vomiting accompanied by diarrhea occurred 3 times and nausea and diarrhea once from the inoculation of nonenterotoxin containing material. The various control materials given to 5 kittens on repeated inoculation produced almost the same degree of tolerance to the final test dose of enterotoxin as did repeated inoculations of enterotoxin to 2 kittens receiving this material only, and the

TABLE 1

Results of Multiple Intra-abdominal Inoculations of Enterotoxin and Nonenterotoxin Materials in Equal Doses, at Regular Intervals, in Previously Unused Kittens

Days between Inoculations Cat No.	Weight in Grams	—		2		2		2		10	
		Inoculum	Reaction	Inoculum	Reaction	Inoculum	Reaction	Inoculum	Reaction	Inoculum	Reaction
1	1,000	C.P. ¹	+++	C.P.	0	C.P.	±	C.P.	0	C.P.	0
2	1,050	C.P.	++++	C.P.	+	C.P.	+	C.P.	0	C.P.	+
3	900	Broth	0	Broth	0	Broth	0	C.P.	0	C.P.	+
4	1,400	Formalin broth ²	0	Formalin broth	+	Formalin broth	0	C.P.	+	—	—
5	800	W-46 ³	+++	43 ⁴	±	W-46	0	C.P.	+	—	—
6	1,200	—	—	Autolysate C.P. - organisms	0	Formalin broth	+	C.P.	++	—	—
7	1,250	—	—	W-46	0	43	0	C.P.	++++	—	—
8	1,200	—	—	—	—	—	—	C.P.	+++	—	—
9	1,200	—	—	—	—	—	—	C.P.	++++	—	—

¹ C.P. = Enterotoxigenic strain. ² Formalin broth = 0.3 per cent formalin in infusion broth.

³ W-46 = "Wood" strain, nonenterotoxigenic. ⁴ 43 = Nonenterotoxigenic strain.

* Vomiting occurred less than 15 minutes after inoculation.

* Staphylococci used in this experiment and others here reported were obtained from the following sources:

W-46, nonenterotoxigenic Wood strain obtained from Dr. Dolman.

43, nonenterotoxigenic strain isolated from the Bundaberg disaster, obtained from Dr. Dack.

C.P.; C.C.P.; W.C.; and C.E. isolated by the author from cream filled pastries sent to this laboratory by the Massachusetts State Department of Public Health. These pastries were incriminated in four separate outbreaks of food poisoning. All four strains are yellow pigmented staphylococci and produce high titers of enterotoxin, with varying amounts of *alpha* and *beta* hemolysins.

degree of tolerance in all varied in direct proportion to the number of previous inoculations, regardless of the materials employed. Three of the animals were again inoculated (fifth inoculation) after a 10 day rest period, and 2 which previously failed to react again responded in a positive manner. We conclude from this that peritoneal irritation resulting from the inoculation

of even sterile culture medium results in slower or less complete absorption of subsequently inoculated toxic materials. After a prolonged rest period this low grade peritonitis clears and normal absorption may again occur. It was not possible to determine through this experiment whether or not specific immunity results from repeated inoculations of enterotoxin, for the non-specific peritonitis masked the other possible effects.

Intravenous Kitten Test—

Davison, Dack, and Cary^{10, 11} have used the intravenous and intracardiac routes for inoculating cats. In our experience, which includes over 175 intravenous inoculations of toxic material, this route provides the method of choice. We have been pleased to find that not only were nearly mature or adult cats more easily handled and inoculated, more easily obtained, and less susceptible to epizootic disease, but they were also more susceptible to toxins inoculated by the intravenous route than are the tiny kittens employed by Dolman and his associates. For all practical purposes the same amount of toxin can be expected to produce a similar response in any animal ranging from about 800 gm. to the largest cat.

To perform the test, the cat, without anesthesia, should be placed on its back on an animal board and the inner aspect of one thigh shaved to a point just below the knee. Slight pressure over the vein near the inguinal region enables one easily to see and enter the saphenous vein at about the level of the knee, or just above, with a sharp 26 gauge needle. After releasing the pressure above, the syringe and leg should be grasped together with one hand and the injection made slowly. Depending on the toxin, from 0.5 ml. to 5 ml. may be required. The toxin must of course be first treated to inac-

tivate the lethal factor or factors. This we find most convenient to do by heating a small amount for 30 minutes in a boiling water bath. The precipitate should be sedimented and the supernate used as inoculum. When heat is used, the supernate from well centrifuged cultures may be safely used without filtration. Sterility, in practice, appears to be unnecessary. So far, although 49 inoculations of many different materials which did not contain enterotoxin have been made by this route, some of them in doses up to 12 ml., no nonspecific vomiting has occurred.* Only one cat has died as a result of inoculation of either toxic or nontoxic materials and this was due to an immediate anaphylactic-like reaction after rapid inoculation of a large dose of enterotoxin in a cat which had received many previous inoculations.

After repeated inoculation tolerance develops, but this occurs to a much less degree than when the intra-abdominal route is used. No single experiment has been planned to demonstrate the degree of resistance developed, but an analysis of the protocols of individual animals is productive of information in this regard. We have never found any cat which failed to vomit on first intravenous inoculation with a reasonable dose of enterotoxin. Great individual differences occur, however, in apparent degree of tolerance acquired and its rapidity of development. A dosage of 2.0 ml. of toxin of average potency will produce a severe reaction on first inoculation. A somewhat less severe reaction will usually occur on repeating this dose, apparently regardless of the time interval following the previous inoculation. An increase of 50 per cent to 100

* Since submitting this paper for publication, aqueous extracts of fish, after dialysis, have produced nausea and vomiting in cats. This work was done at the George Williams Hooper Foundation, University of California, with Mr. C. W. Lane and associates.

per cent in dosage for the third inoculation gives a moderate or severe reaction. At the next a further increase in dosage is frequently required. Because of the uncertainty of response and the increased volume of inoculum necessary, we seldom use an animal the fourth time, and never accept as final the results of a negative test unless repeated on at least 2 previously unused animals in a minimal dose of 3 ml.

The following experiment demonstrates that the acquired tolerance is not lost, at least in entirety, during a period of rest. Six cats (see Table 2) which had been inoculated with enterotoxin from 1 to 10 times previously, were given a complete rest for 2 months, then all were retested with a

perature after a chill also occurs following intra-abdominal inoculations, but we are not aware that it has been previously described. Diarrhea, although it occurs in most animals and is frequently very conspicuous, may occasionally be of a very mild nature. When present it usually persists for several hours. Vomiting may recur at intervals of from 5 minutes to 1 hour over a period of 2 or 3 hours. After 3 to 4 hours from the onset of symptoms, the cat is frequently noticeably less ill and 24 to 48 hours later it appears normal if opportunity has been afforded for rehydration. Not infrequently animals develop diarrhea following inoculation of control materials, so vomiting only can be accepted as

TABLE 2

Effect of a 3.0 Ml. Intravenous Test Dose of Enterotoxin on Cats with Varied Experience After a 60 Day Rest Period

Cat	Number Previous Inoculations	Time in Minutes Nausea Noted	Time in Minutes Vomiting Occurred	Degree of Diarrhea
1	1	39	40	++++
2	2	38	40	+
3	2	55	58	+
4	6	63	—	0
5	7	55	—	0
6	10	—	—	0

3 ml. dose of a potent toxin. The results are similar to those which might have been expected had no rest period been allowed.

The train of symptoms observed after an intravenous inoculation of enterotoxin differs little from that described by Dolman, Wilson, and Cockcroft¹ following intra-abdominal inoculation. In from 15 minutes to 2 hours, most frequently in about 30 minutes, vomiting occurs, preceded by nausea. Coarse tremors are usually noted and the hair stands erect. This we interpret as a chill or rigor for we have found that the temperature soon begins to rise, usually to 104° F. or 106° F., attaining this maximum only after 2 to 4 hours. This rise in tem-

perature after a chill also occurs following intra-abdominal inoculations, but we are not aware that it has been previously described. Diarrhea, although it occurs in most animals and is frequently very conspicuous, may occasionally be of a very mild nature. When present it usually persists for several hours. Vomiting may recur at intervals of from 5 minutes to 1 hour over a period of 2 or 3 hours. After 3 to 4 hours from the onset of symptoms, the cat is frequently noticeably less ill and 24 to 48 hours later it appears normal if opportunity has been afforded for rehydration. Not infrequently animals develop diarrhea following inoculation of control materials, so vomiting only can be accepted as specific. Since vomiting and occasionally diarrhea are conspicuous symptoms of a very common and highly infectious type of feline epizootic, panleucopenia (encountered and studied by Hammon and Enders^{12,13} concurrently and independently with Lawrence and Syverton,^{14,15}) it is quite important that the cats used be known to be in good health. Enders and Hammon¹⁶ have described a satisfactory method of actively or passively immunizing experimental animals. A moderate size meal eaten shortly before the inoculation of enterotoxin has been found to increase the effectiveness of the vomiting stimulus, and noted refusal of the offered meal aids distinctly in the elimination of sick animals.

Use of Chick Embryos—

Very careful tests were repeatedly made to determine whether inoculation of developing chick embryos might serve as a method of detecting the presence of enterotoxin. Inoculations were made onto the surface of the chorio-allantoic membrane through an artificial air space, also directly into the yoke sac, but without any apparent effect upon the life of the embryo.

CHEMICAL AND PHYSICAL STUDIES

Using the intravenous cat test which had been found to be highly specific for culture toxins (after inactivation of other toxic factors and observing the criteria mentioned above, *i.e.*, interpreting only as positive those materials which produced definite vomiting and accepting for negative those materials which in doses of at least 3 ml. failed to produce vomiting in at least 2 previously unused animals), we undertook a study of the chemical and physical properties of the food poisoning toxin. As a preliminary step to chemical fractionation, with Dr. Favorite¹⁷ we developed a simplified medium and method for producing highly potent enterotoxin. This medium is extremely simple and contains only dialyzable substances; acid casein hydrolysate, glucose, vitamin B₁ and nicotinic acid, none of which substances are antigenic or give a positive Biuret reaction. No agar was found necessary, thus eliminating another substance which we found to be antigenic when inoculated in rabbits. Except where otherwise stated this medium was used in all the experiments described below.

Dialysis Experiments—

Jordan and Burrows¹⁸ and Minett⁴ reported enterotoxin to be dialyzable. We have confirmed this repeatedly, using cellophane membranes and sacs, but noticeable losses occurred at some point during the procedure. However,

at no time were we able to detect any enterotoxin in the dialysates, even after applying hydrostatic pressure to the bag contents and concentrating the test material by evaporation. Evidence is conclusive, we consider, regarding the large size of the toxin molecule.

Heat Stability—

It has been repeatedly demonstrated by many workers as well as ourselves that this toxin is able to withstand a temperature of 100° C. for 20 to 30 minutes with very little loss in activity.^{2, 3, 5, 19}

Effect of Acid and Alkali—

Although Jordan¹⁸ and Borthwick²⁰ report to the contrary (the tests which they employed cannot be accepted as reliable or specific in the light of present knowledge), Minnett⁴ found enterotoxin resistant to HCl at a pH of 5.0. *In vivo*, since man is susceptible to this toxin taken by mouth, it would seem probable that it would be resistant to an even lower pH, similar to that found in the stomach. Using acetic acid to lower the pH of a culture toxin to pH 4.5 we found the toxin to be present and active in the supernate after incubation for 24 hours at 37° C. Similar treatment with NaOH at a pH of 8.0 to 8.2 appeared to have no deleterious effect.

Effect of Enzymes—

Although Minett⁴ reports that a formalinized filtrate containing enterotoxin was inactivated by trypsin in 4 hours at 37° C. we have twice found crude toxins to be unaffected by this enzyme. The toxin was placed in a dialyzing membrane with 2 per cent trypsin and the reaction adjusted to pH 8.0 and this in turn suspended in a buffer solution of pH 8.0. After 48 hours' incubation at 37° C. the other toxic factors had been entirely destroyed but the material produced vomiting in

all of 4 cats inoculated by the intravenous route. Three new cats inoculated with 3 to 3.8 ml. of culture medium which had been subjected to an identical digestion with trypsin showed no reaction following inoculation.

In a similar manner to that used for the digestion with trypsin, 2 per cent pepsin in a pH of 4.3 was permitted to act for a period of 24 hours at 37° C. A control of uninoculated culture medium was similarly digested. Tests for hemolysins to rabbit cells showed these to have been completely destroyed by the digestion, but intravenous cat tests indicated that pepsin failed to digest the enterotoxin.

Effect of Fat Solvents—

Davison and Dack¹¹ found enterotoxin insoluble in chloroform, although Jordan and Burrows¹⁸ reported solubility in both chloroform and ether. We were unable to find any active enterotoxin in ether extracts, but found it in the residual extracted culture filtrate. Davison and Dack¹¹ report that they found enterotoxin to be insoluble in alcohol, and that it was occasionally precipitated in 50 per cent and in 76 per cent alcohol. They, however, were unable consistently to duplicate their results. We have been able repeatedly to precipitate enterotoxin with ethyl alcohol, both from crude casein hydrolysate toxin and from infusion broth toxins. In experiments where the toxin had been first dialyzed, 0.8 per cent NaCl was added as an electrolyte; otherwise no adjustment was made of electrolyte or of pH. In all instances two volumes of 95 per cent ethyl alcohol were added to one volume of toxin. This was stored at 2° C. for from 24 to 48 hours and the sediment collected by centrifugation and redissolved in normal saline.

Precipitation by Ammonium Sulfate—

Davison and Dack¹¹ report con-

sistent results with ammonium sulfate treatment of toxic material. In their hands, 50 per cent saturation failed to precipitate enterotoxin, while complete saturation did so effectively. Previously, in attempting to separate various hemolysins by fractional precipitation with ammonium sulfate, we had found that practically all detectable *alpha* and *beta* hemolysins were precipitated by 65 per cent saturation. When 75 per cent saturation was employed with enterotoxic filtrates all other toxins were precipitated but enterotoxin was found to remain in solution. Sterile medium and cultures of nonenterotoxigenic staphylococci treated in a similar manner invariably failed to produce vomiting in cats.

Purification of Toxin by Combined Ammonium Sulfate and Alcohol Treatment—

A combination of the two previous procedures was next employed, precipitating out the known antigenic hemolytic and dermonecrotic substance with ammonium sulfate, then precipitating the enterotoxin from the dialyzed supernate by means of alcohol. This procedure was carried out twice with toxins prepared from the "C.E." strain (originally very low in hemolytic titer) in casein hydrolysate medium and as a control repeated on a toxin from strain "W-46" (nonenterotoxigenic). The final precipitate in each case was redissolved in a volume of distilled water equal to about 40 per cent of the volume of the original toxin. For inoculation 0.8 per cent NaCl was added. Although considerable loss occurred, a reasonable titer of toxin was found in each preparation originally containing enterotoxin (2.0 ml. to 6.5 ml. produced vomiting) and the control material produced no reaction.

The second preparation with the enterotoxigenic strain was subjected to certain quantitative and qualitative

chemical tests. The total solids were found to be 1.8 mg. per ml. A micro-Kjeldahl done in duplicate on 1 ml. of the final solution showed no detectable nitrogen. From the appearance of the acid digested residue, considerable carbonaceous material was obviously present. The Biuret test was entirely negative and the Molisch test was positive. After hydrolysis for 1 hour at 100° C. in the presence of 1.5 per cent HCl, a Folin-Wu quantitative blood sugar test was made which indicated the presence of reducing substance equal to about 0.1 mg. of glucose per 1 ml. of solution. The final solution from the first material prepared gave similar results with the Biuret and the Molisch tests. The control material from the nonenterotoxigenic strain gave an extremely small amount of precipitate on treatment with alcohol and the total solids in the final solution were found to be only 0.45 mg. per cent. The micro-Kjeldahl and the Biuret reaction employed on the active material, under the conditions of the test, would be expected to indicate the presence of protein had it represented 10 per cent of the solid material present, but very likely would not have detected smaller quantities.

Immunological Studies—

Although much has been written regarding the immunological aspects of enterotoxin,^{1, 4, 6, 10, 21, 22} there is little in the way of convincing evidence for its antigenicity. Tolerance and immunity may be very easily confused, and it is possible that much that has been interpreted as immunity may have been partly or entirely due to some form of tolerance. It is possible that many so called "neutralization tests" could not be properly evaluated because of the imperfections of the test method, pit falls in interpretation, or poor suitability of the test animal.

We have as yet made no immuno-

logical test with the partially purified toxin by the ammonium sulfate-alcohol procedure, but repeated attempts with crude toxins to demonstrate specific agglutination, precipitation and *in vivo* neutralization through the use of "hyperimmune" sera from cats and rabbits failed to demonstrate any definite antigenic properties. With the possibility in mind that enterotoxin might be antigenic through a haptene linkage, and on finding that attempts to separate the enterotoxin from trypsin, after tryptic digestion, by heat and by acid precipitation were unavailing, this material containing trypsin was used to immunize a rabbit. Serum from this rabbit failed to show any precipitation or agglutination with enterotoxic material not containing trypsin, although a high titer antitrypsin serum was obtained.

DISCUSSION AND CONCLUSIONS

It would appear from the results of this study that the intravenous cat test for enterotoxin is one which can be readily applied to heat treated culture filtrates in any health department laboratory. Since adult cats or large kittens can be used, no difficulty should be encountered in acquiring and keeping the necessary animals, and each may be used three or four times before developing too great a tolerance. Negative results, however, should be confirmed by inoculation of at least two previously unused animals. A healthy cat, given a meal shortly before inoculation, should react by actually vomiting before any test is considered positive. This method of inoculation has definite advantages over the intra-abdominal route.

By use of the above test for detecting the presence of enterotoxin, certain chemical and physical studies have been made possible. The large size of the enterotoxin molecule has been confirmed. Unlike most proteins it is rela-

tively heat stable, and we have demonstrated that it is resistant to both trypsin and pepsin. Evidence from our work suggests strongly that it is non-antigenic. It is precipitated under certain conditions by alcohol and by high concentrations of ammonium sulfate, but not in a 75 per cent saturated solution of the latter. Unlike fats, it is not soluble in chloroform, ether, or alcohol. Small amounts of material originally prepared in a simple, protein-free medium, and which had undergone considerable purification by fractionation with ammonium sulfate and alcohol, were shown to be active yet, in the concentration used for inoculation, contained no detectable nitrogen by the micro-Kjeldahl method and contained a reducing carbohydrate substance. It seems probable from this evidence that the active substance is in the form of a large, complex carbohydrate molecule, and is not a protein.

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Studies in the Epidemiology of Primary and Secondary Syphilis in New York City

BRUCE WEBSTER, M.D., AND E. I. SHELLEY, R.N.

*Syphilis Clinic of the Department of Medicine, New York Hospital and Cornell University Medical College, New York, N. Y.**

ALTHOUGH contact studies have long been an accepted means of case finding in the majority of infectious diseases, workers in the field of syphilis control have been slow to adopt this method of approach. Wheeler¹ reviewed briefly the status of the epidemiology of syphilis in 1937. Among the outstanding early studies are those of Leland, Nelson, and Gorman² who found and examined 74 per cent of the sources of their cases of infectious syphilis and 58.5 per cent of the contacts. Munson³ by his technic of "sole-leather epidemiology" showed the possibilities of contact investigations in epidemics in small communities. Brumfield and Smith⁴ proved the practicability of such studies in Charlottesville, Va. Ingram⁵ in 1936 reported epidemiological studies on 200 cases of infectious syphilis with special reference to the social service methods used. These cases named 174 contacts, of whom 73.5 per cent were examined. In 1938, Clark and Sargent⁶ reported epidemiological studies on 488 cases of early syphilis in the Health Department clinics of Buffalo, N. Y. They were able to establish and locate the source

of infection in approximately 14 per cent of their cases. For every 9 initial cases investigated, 1 hitherto unknown case was placed under treatment. These authors were skeptical of the efficacy of epidemiological studies in syphilis control. Turner, Gelperin, and Enright⁷ in 1939, made a careful epidemiological investigation of 247 patients with primary and secondary syphilis admitted to the syphilis division of the medical clinic of the Johns Hopkins Hospital. Contact investigation succeeded in bringing under treatment 114 previously unrecognized cases of syphilis, two-thirds of which were potentially infectious. This is a ratio of 46 contact cases to 100 original cases. Clark,⁸ in 1940, has reported the results of two years' epidemiological studies on 824 cases of syphilis admitted to the syphilis clinic of Vanderbilt University Hospital at Nashville, Tenn. Of these cases, 204 had primary or secondary syphilis. They named 387 sexual contacts, of whom 88.7 per cent were examined. Of this latter group, 75 per cent had syphilis. Investigation of these contacts led to the discovery of 213 persons with infectious syphilis, a ratio of 104 to each 100 original patients.

These studies from the leading syphilis clinics of the country prove the awakening of an interest in this

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long neglected aspect of syphilis control.

Early in 1937, shortly after the organization of the syphilis clinic of the New York Hospital, plans were made in an attempt to determine what could be done in the way of contact studies in early syphilis in such a clinic in New York City. The New York Hospital is a voluntary hospital, without official connection with the Department of Health of the City of New York. The organization of this clinic has been previously described.⁹ Because of its shifting population and its great area, this city presents problems in any form of epidemiological study which do not exist in rural communities or small cities.

MATERIAL ON WHICH EPIDEMIOLOGICAL STUDIES ARE BASED

The present study comprises cases of infectious syphilis (primary and secondary) admitted to the clinic during the years 1937, 1938, 1939, and 1940. These cases came from a variety of sources. Because of the facilities at the New York Hospital for the isolation of cases of infectious syphilis, some of them were referred by the clinics of the Department of Health of New York City for hospitalization. Other cases came voluntarily to the clinic, seeking admission, while still others were referred by the various departments in the hospital. The cases represented a wide range of occupational and social status. Some were of the so-called "white collar" group, while others were definite derelicts.

During the middle two years of the study there was an increase in the ratio of colored to white cases due to the fact that many of the white male cases were being hospitalized elsewhere for another study. This also accounts for the high percentage of females. These cases were unselected and represent all the cases of infectious syphilis registered in the clinic during the four years of

the study. They resided in a wide area comprising New York City and its environs.

Table 1 shows the distribution of these 269 cases of primary and secondary syphilis as to sex and race.

TABLE 1
Cases of Infectious Syphilis
(Distributed as to Race and Sex)

	Number	Per cent
<i>White-</i>		
Male	91	33.8
Female	60	22.3
<i>Negro</i>		
Male	40	14.9
Female	78	29.0
<i>Total</i>	269	
<i>Sex Total</i>		
Male	131	48.7
Female	138	51.3
<i>Race Total</i>		
White	151	56.1
Negro	118	43.9

METHODS

These studies have been carried out under the direction of the Assistant Professor of Medicine in charge of the Syphilis Clinic. The various clinic or resident staff physicians worked in close collaboration with a public health nurse in obtaining information in regard to contacts. The field work was done almost entirely by one public health nurse who had had previous training in syphilis control work. Thus the material contained in the present study represents the routine work of the clinic staff, rather than a special epidemiological study undertaken by experts in that field.

The majority of the patients comprising the present study were hospitalized in the New York Hospital for from 1 to 2 weeks during and following their period of infectiousness. This period of hospitalization would appear to be an important factor in the

naming and finding of both sources of infection and contacts. The public health nurse visits the patients daily during this period. Confidence is thus established and additional contacts are named or more information is given. Further, the visitors who come to see these patients during their stay in hospital provide many of the sources and contacts. Preliminary questioning as to the source of infection and the members of the family and other individuals exposed is carried out by the physician at the time the medical history is taken. With this information as a beginning, the public health nurse prepares a brief case study. This is used as a basis for further social or epidemiological work. As the contacts are named, they are listed as such on a special contact sheet in the patient's history. When these cases are brought in for examination, they are given complete physical examinations, including blood Wassermann and dark-field examination of all suspicious lesions. Even though no evidence of syphilis is found, they are followed until a period of 3 months has elapsed from the time of exposure.

When a contact was found to have infectious syphilis, an attempt was made to identify and examine his own contacts. These infected contacts were not counted as original cases, but have been designated "contacts of contacts."

No special technic has been used in obtaining the information regarding contacts from the patient. Every attempt was made to elicit his confidence and coöperation. The identity of the patient who had given the name of a non-marital sexual contact was not revealed unless the full circumstances of the patient's illness and hospitalization were already known to this contact. The contact cases had always the opportunity of consulting their private physician if they so desired. If the examinations were done by an outside

physician, his reports were recorded on the contact sheets. If the contacts or sources of infection resided in another city, all available data were sent to the health officer of that area with a request that he furnish us with a copy of the results of his investigations.

Considerable controversy appears to exist among students of the epidemiology of syphilis as to whether or not actual sources of infection can be identified as such. With full realization of the uncertainty of such a designation, an attempt has been made in the present study to determine "probable sources of infection." For purposes of this study, an individual was regarded as a probable source of infection when he or she, after having been named as a source by another person, was found to have early syphilis—in a stage which made it possible for him or her to have been the source of infection for the individual concerned.

MATERIAL

During the four years of the study 269 cases of primary or secondary syphilis were admitted to the clinic. They were almost equally divided as to sex (Table 1). Fifty-six per cent were white and 44 per cent were Negroes. The contact cases and their contacts are separated from the original patients in the tables and discussion in this study. Cases of latent syphilis discovered through contact investigation are not included in the present presentation.

RESULTS

The results of the contact investigation are shown in Table 2. The 269 cases of infectious syphilis named 663 contacts. A contact was considered as named if enough information was given to make an investigation seem justifiable. In some cases exact names and addresses were available. In others, only descriptions and probable "hang-

TABLE 2
Contacts of Cases of Infectious Syphilis, 1937-1940

	White				Negro				Total	
	Male		Female		Male		Female			
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Original patients with infectious syphilis	91	33.8	60	22.3	40	14.9	78	29.0	269	100
Contacts named by original cases	151	....	158	....	192	....	162	....	663	....
Contacts of original cases found and examined	125	82.8	134	84.8	139	72.4	143	88.3	541	81.7
Contacts found to have infectious syphilis	42	33.6*	28	20.9*	63	45.3*	39	27.2*	172	31.8*
Contacts named by contacts	31	....	20	....	31	....	29	....	111	....
Contacts of contacts found and examined	31	100.0	19	95.0	28	90.3	28	96.5	106	95.5
Contacts found to have infectious syphilis	17	54.8*	7	36.8*	16	57.5*	12	42.8*	52	47.0*
Number of infectious cases found per 100 original cases	64.8	....	58.3	....	197.5	....	65.4	....	83.3	....

* Of number examined

outs" were known. An average of 2.46 contacts per case were named.

Of the contacts named, the greatest number were colored males. However, this group yielded the lowest percentage (72.4 per cent) of cases which could be located and examined. This would appear to be due to the lack of definite information which could be obtained about the individuals of this group. The ratio of contacts found and examined to those named was remarkably constant in the white males and females and the colored females; being 82.8, 84.8, and 88.3 per cent respectively. An average of 81.7 per cent of all contacts named was found and examined. The majority of these contacts were examined in the Syphilis Clinic of the New York Hospital. In a few cases (less than 5 per cent) these examinations were done by private physicians or coöperating health agencies in other cities. Only when the reports from these outside agencies were definite and clear-cut, was the information included in our record.

Reference to Table 2 will show that 31.8 per cent of all contacts examined were found to have infectious syphilis. Cases of late syphilis discovered in this group were not included in this study. As might be expected from previous reports, the highest percentage of con-

tacts found to have primary or secondary syphilis occurred in the colored male group (45.3 per cent). This is in spite of the fact that a smaller percentage of named contacts was located in that group. The lowest percentage of infected cases (20.9 per cent) was in the white female group.

As the contact cases were brought under observation, they in turn were questioned as to individuals exposed by them. Because of the time necessary for the disease to develop, many of these contacts of contacts were under observation before any clinical or laboratory evidence of syphilis had manifested itself. Sometimes signs became apparent only after several examinations of the syphilis suspect. This element of time could account for the high percentage of contacts of contacts found and examined (95.5 per cent) and for the higher percentage of those examined contacts shown to have infectious syphilis (47.0 per cent). Many other factors enter into the fact that apparently contact investigation is more successful in the so-called "contacts of contacts" than in the original contacts. Important among these is the establishment of confidence in the hospital among the group of patients concerned. Because of the time which of necessity has elapsed, this is more firmly grounded

than during the investigation of the original contact.

It has become customary to express the results of syphilis contact investigation in terms of new cases found for every 100 original cases. In the present study 83.3 new cases of infectious syphilis were discovered as a direct result of contact investigation of every 100 original patients. Cases of late syphilis uncovered by the investigation are not included here. This figure is obtained by adding the 172 cases of infectious syphilis discovered among the contacts and the 52 cases found among the contacts of contacts. Thus, the investigation of the contacts of 269 original cases, yielded 224 new cases of infectious syphilis (83.3 per 100 original cases). The greatest yield occurred among the colored males (197.5 new

cases per 100 original cases). Least productive of results were the white females (58.3 new cases per 100 original ones).

Distinction has been made between familial and non-familial contacts. Individuals residing in the household of the patient are considered familial. The non-familial contact group is comprised almost entirely of sexual contacts who are not members of the patient's immediate family. Tables 3 and 4 show the distribution of the contacts and sub-contacts made in this way. It would appear that contact investigation was most productive of results in the non-familial group since 64.2 per cent of the infected cases were found among this group. The non-familial males had twice as many infected cases as the non-familial females.

TABLE 3
Contacts of Cases of Infectious Syphilis
(Distributed as Familial or Non-Familial)

	White								Negra								Total No.
	Male				Female				Male				Female				
	Fam.		Non-Fam.		Fam.		Non-Fam.		Fam.		Non-Fam.		Fam.		Non-Fam.		
	Per	Per	Per	Per	Per	Per	Per	Per	Per	Per	Per	Per	Per	Per			
	No. cent	No. cent	No. cent	No. cent	No. cent	No. cent	No. cent	No. cent	No. cent	No. cent	No. cent	No. cent	No. cent	No. cent			
Contacts																	
Named by original cases	67	10	84	13	99	15	59	9	63	10	129	19	102	15	60	9 663	
Found and examined	65	12	60	11	97	18	37	7	62	11	77	14	101	19	42	8 541	
Found to have infectious syphilis	15	9	27	15	13	7	15	9	17	10	46	27	15	9	24	14 172	
Named by contacts	12	11	19	17	15	14	5	4	20	18	11	10	19	17	10	9 111	
Found and examined	12	11	19	18	15	14	4	4	18	17	10	9	19	13	9	9 106	
Found to have infectious syphilis	3	6	14	27	3	6	4	8	8	15	8	15	6	11	6	11 52	

TABLE 4
Summary of Contacts Found to Have Infectious Syphilis
(Distributed as to Familial or Non-Familial)

	Familial		Non-Familial	
	Number	Per cent	Number	Per cent
Contacts	60	26.8	112	50.0
Contacts of Contacts	20	9.0	32	14.2
Total	80	35.8	144	64.2
Sex Distribution				
Male	43	19.2	95	42.4
Female	37	16.5	49	21.9
Race Distribution				
White	34	15.0	60	26.3
Negro	46	20.5	84	37.5

PROBABLE SOURCES OF INFECTION

Although it is well recognized that sources of infection in syphilis are much less apt to be capable of accurate determination than in other infectious diseases, it was thought to be worth the effort in the present study to attempt to differentiate the probable source from the other contacts. Elsewhere in this report these so-called sources are considered as contacts. The following criteria were set up for the designation of a case as a source of infection. The individual concerned must have been found to have syphilis, in a stage compatible with the time element concerned. This, together with the history of exposure by the contact would seem adequate evidence to consider the person a *probable* source of infection for the contact concerned.

It is realized that the opportunity for error is great. The following data on probable sources of infection are presented, therefore, at their face value only. In the case of professional prostitutes, it would seem to be important to expend special effort to locate and bring them under treatment if they are named as "sources."

In the present study, 170 (63.2 per cent) of the 269 original cases named a probable source of infection which met the requirements mentioned above. Of these, 99, or 58.2 per cent, were found to have infectious or early latent syphilis.

The high percentage of Negro females

(96.1 per cent) naming the probable source of infection is due to an "epidemic" which occurred in a high school and which was traceable to one individual.

COST OF CONTACT INVESTIGATION

Turner and his coworkers⁷ have estimated that the cost of contact studies per infectious case brought under treatment was about \$18 at the Johns Hopkins Hospital. As they have pointed out, an exact cost accounting is extremely difficult since it would necessitate an estimate of the time expended in this work by physicians. However, in the present study practically all of the field work was done by one public health nurse. Since this represents the major item of expense, the cost of the field work, plus the time of this nurse spent in clinic interviews, may be considered the cost of the contact studies. In this instance, it is estimated that the nurse spent one-half of her time carrying out contact investigations. On this basis, the cost of four years' study was \$4,000. This includes the field expenses of the worker. As a result of this expenditure, 224 infectious cases were discovered. The average cost per case was accordingly approximately \$18. This is identical with the figure arrived at by Turner and his associates.

DISCUSSION

The wide variation in the results of contact investigation of infectious syph-

TABLE 5
Probable Sources of Infection

	White				Negro				Total	
	Male		Female		Male		Female			
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Number of original cases	91	33.8	60	22.3	40	14.9	78	29.0	269	100
Probable source of infection known	27	29.7	44	73.3	25	62.5	75†	96.1†	170	63.2
Probable source of infection found and brought under treatment	14	51.9*	28	63.6*	14	56.0*	43	57.3*	98	58.2*

* Of known sources

† See text

ilis, as previously reported by the various workers in the field would appear to leave considerable doubt as to the practical value of such investigations as a means of syphilis control. The present study would seem to indicate that such an investigation can be carried out as a routine measure by the regular staff of a syphilis clinic without undue expense. The fact that these studies were made by individuals without special epidemiological training would seem to be important in that it indicates that contact investigation is within the realm of the small clinic without such specially trained people. Unquestionably the results of the present study would have been better had such expert assistance been available. The fact that one individual physician established the diagnosis, was responsible for the clinical care, and directed the contact investigation of the patient may be a factor in the results obtained, since, in this way a better than usual patient-physician relationship was established.

The importance of beginning the contact investigation in infectious syphilis as soon as the diagnosis is established in the original case is apparent as a matter of common sense. The value of this is directly demonstrated in Table 2 in the high percentage of contacts of contacts (95.5) found and examined. Such cases were, in many instances, under observation before clinical signs of the disease developed.

As has been found by other investigators, the examination of non-familial sexual contacts was the most productive in the finding of new cases of infectious syphilis.

SUMMARY

1. Contact investigations were carried out as a routine measure by the regular staff in a series of 269 cases of primary and secondary

syphilis admitted to the syphilis clinic of the New York Hospital during the years 1937 to 1940 inclusive.

2. These 269 cases named 663 contacts (2.46 contacts per case). Of these contacts, 541, or 81.7 per cent, were found and examined.

3. As a result of contact investigation of these 269 original cases, 224 new cases of infectious syphilis were found. This is a ratio of 83.3 new cases of infectious syphilis for every 100 original cases.

4. The approximate cost of carrying out these investigations was \$18 per contact found to have infectious syphilis.

5. The *probable* "source" of infection was thought to be known in 170, or 63.2 per cent, of the original cases. Of this number, 98, or 58.2 per cent, were found and brought under treatment.

6. Epidemiological investigation of cases of infectious syphilis would appear to be both feasible and financially possible in a large metropolitan area such as the City of New York. Such investigations can be carried out by a voluntary hospital. It is suggested that the follow-up and the bringing under observation of all contacts of cases of infectious syphilis is a direct responsibility of the clinic or individual undertaking the treatment of these cases.

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NOTE: The authors wish to express their indebtedness to the physicians, the social workers, and the clinic executive of the Syphilis Clinic and to the resident staff of the Department of Medicine of the New York Hospital for their aid throughout this study. We are indebted to the Bureau of Social Hygiene of the Department of Health of the City of New York for the referral of some of the cases.

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YESTERDAY'S SCHOOL CHILDREN ARE EXAMINED FOR THE ARMY

IT is now fairly common knowledge that a large proportion of the young men of the country, examined by Selective Service Boards, have been found physically or mentally unfit for military service. On learning this the public has been astonished, sociologists appear somewhat apprehensive, and that part of the medical profession accustomed to deal only with the frankly sick has been disquieted. These findings, however, have not come as a surprise to those engaged in public health work for they knew these young men when they were school children, and on the basis of that knowledge could have forecast, with fair accuracy, just about what would be found on physical and mental examination some ten or fifteen years after.

Reacting from its astonishment, the public is inclined to ask who is responsible, and repeats the old plaint, frequently heard in other elements of our defense preparation: why were we not told of these things? In this instance the public was told, and told repeatedly. Public appropriating bodies were informed and when yesterday's school children, under the auspices of one agency or another were examined, school physicians, dentists, nurses, and teachers urged parents, time and again, to have these children's defects corrected and otherwise to inaugurate a hygienic regimen. Some did this, others through ignorance, procrastination, or lack of funds did not. The results are as would be expected. It is, however, more difficult to answer the public's question as to who is responsible for these health deficiencies in man power. It must be borne in mind that a certain amount of disability in a population is inevitable. There are limits beyond which preventive medicine cannot go, and there are pathological conditions which do not permit of correction or complete recovery; and no one may force a mother to take her child to a doctor or a dentist. But the recognition of these things does not entirely account for failure to insure a higher level of health in men of military age. A number of other factors have operated. It is impossible to discover them all or to determine exactly their relative importance, but consideration

of the part played by the following groups, situations, and influences may be of value as guides for the future.

One of the most serious deterrents to better national health would seem to have been the attitude, even worse in the past than at present, of those who have held the purse strings of national, state, and local governments. With few exceptions, politicians' eyes have been as blind to health needs as have their ears been deaf to pleas for more adequate public health appropriations, and few votes were lost by this indifference. A second factor, largely responsible for disabilities in public health, is undoubtedly the public itself. The average individual calls for medical care only when incapacitated. He is but little concerned with what, to him, is a minor disability, the correction of which may cause discomfort or waste money. Even though his knowledge of health matters is meager, only to a very limited extent has he acted upon what he already knows. A third influence bearing upon the health of the nation is, of course, economic. No inconsiderable proportion of the public lacks funds with which to obtain the necessities of healthful living, which, among other things, includes hygienic housing, adequate and balanced nutrition, and medical and dental services. Aggravating this situation is the fact that in most sections of the nation there is an inadequacy of public hospital and clinic service, particularly dental, and other public medical facilities. Making such facilities available has been delayed, possibly in the long run wisely delayed, by the clash of conservative and radical opinion as to how this might best be done.

Some of the deficiencies in the public health must in all fairness be charged to medical education, which has tended to foster in the doctor of tomorrow a too exclusive interest in the frankly sick individual. It has not instilled in him a sense of responsibility for the maintenance of health in his patients, and has left the student unaware of the serious burden which society bears in mildly sick or partially disabled citizens. Conventional medical education of the past, too, has provided the medical graduate with but little appreciation of the implications of disease in the mass. Finally, a minor responsibility for the defects in yesterday's school children must be borne by health agencies. A tendency to routinism in many health departments and a seemingly inevitable confusion and overlapping among the voluntary health services, have not contributed to forehanded and effective action in meeting the rapidly changing demands made by public health problems. On the whole, public health work has been creditable. It could have been better with the funds available, and excellent results could have been obtained with more nearly adequate funds and better trained workers.

These then, aside from limitations in knowledge, appear to be the more important of the factors which have operated to the disadvantage of national health. Some of them, in their cause and effect, are as complex as human nature itself; some are inherent in a struggle for existence; and still others arise and probably always will be present as by-products of a not perfect social order. This being the case, not all of these forces can be immediately or completely offset, but those problems which relate to medical education and public health practice are not impossible to solve. Perhaps, too, now that the public is somewhat alarmed, there may come a belated recognition that hard money is a necessary supplement to the politicians' affable but non-productive agreement that public health is a valuable asset.

THE DEATH OF DR. W. FRANK WALKER

ON September 27, 1941, Dr. W. Frank Walker died, after a short illness, in New York City. This came as a terrible shock to those closely associated with him, and will sadden old associates and other friends scattered widely throughout the public health world. No one suspected that his health was seriously impaired, for he went the even and active tenor of his ways with no reference to what he considered his own problem. Characteristic of the man was this ability to carry his own load, and to bear, too, a considerable part of the burden of others without breaking his active stride.

From first service with the Detroit Department of Health in 1914 to and throughout his work with the Commonwealth Fund, Dr. Walker's life was a busy and productive one. His professional training was that of an engineer. Upon this foundation he built his graduate education, acquiring the degree of Doctor of Public Health from the University of Michigan in 1922. Early in his career he served as a Sanitary Engineer in the Detroit Department of Health and later as Deputy Commissioner. After the first World War, having served as First Lieutenant in the Sanitary Corps, U. S. Army, he returned to Detroit and gained a new and valuable type of experience as Superintendent of the Detroit Municipal Tuberculosis Sanatorium. From 1923 to September, 1925, he was a research associate of the American Child Health Association, at that time actively engaged in carrying on the well remembered survey of health work in 86 American cities.

In late 1925 the Committee on Administrative Practice of the American Public Health Association was faced with filling the position of Field Director, recently made vacant by the resignation of Dr. Watson S. Rankin. In view of the background, training, experience, and personality needed in this position, the Committee turned rather naturally to Frank Walker, and this job he did even more brilliantly than had been hoped. With the backing of the experienced personnel of this Committee and with his own admirable approach and keen insight, he created a new state of mind in public health workers. He did not "inspect" their departments but, with rare tact, made them inspect themselves. And what a going-over that was! Departmental self-satisfaction was faced with sharp facts, and assumptions became apparent for what they were. To do a job of this sort and then to be welcomed back a year after as an old friend, is no mean accomplishment.

In the meantime, the Commonwealth Fund, out of its Child Health Demonstrations, had been accumulating a rich store of study material. Because of this and in view of its planned program, the Fund felt the need of a person possessing Dr. Walker's background and personality. He went with them as Director of the Division of Health Studies in 1931, and here his abilities reached full development. Not only did he continue his analyses of active health programs, but he developed excellent critical and interpretive studies of accumulated data and experiences. Out of the latter came his books, *Recording of Local Health Work*, in 1935, and *School Health Studies*, in 1941 (both in collaboration with Carolina R. Randolph). He was also the author of *Influence of a Rural Health Program* and *Ten Years of Rural Health Work*. These contributions he published through the Commonwealth Fund. He found time too to participate actively in Delta Omega's publication of *Panum on Measles*, and the amount

of effort and wise counsel he gave to various committees epitomizes his versatility and his willingness to give of himself.

Perhaps more than anyone else in the public health field, Frank Walker held the professional respect, the confidence, and the affection of divergent and sometimes conflicting groups. They were guided by him, and they trusted him. He fought their battles when he thought them right, and he persuaded them of their wrongness when necessary. His ability and his warm personality will be missed in many, many places.

Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

CONTENTS NOTED

Dear Reader:

On our desk are copies of letters written by a health officer in answer to inquiries from anxious parents. This exchange of correspondence was brought about by a recent epidemic of poliomyelitis which, to parents, is perhaps the most feared of all diseases. The letters to the health officer reveal much of the anguish that wells up in the minds of mothers and fathers when the disease is prevalent in a community. Moreover, the faith and dependence placed in the health officer by the public are evident in these letters. But of more importance is the manner in which the health officer responded. In the most considerate and painstaking way parents were given answers to their questions—answers that set forth the latest scientific information about the disease in terms that any layman could comprehend. And each letter ends with a sympathetic paragraph to allay unnecessary fears.

It strikes us that here is another example of effective health education. Ordinarily letters would not be included among the usual media of informing the public. But isn't it time to recognize correspondence along with booklets, motion pictures, exhibits, posters, and the like as an implement of health edu-

cation? Certainly the correspondence which we have examined seems to indicate that letters can be a potent and effective channel for the dissemination of health information.

No one wants to be told how to write letters, but here are a few pointers which those who handle large volumes of correspondence have found helpful:

1. Letters should be natural. A letter should "talk" just as humanly as the writer would speak.
2. Letters must be sincere. The writer should keep one thing in mind constantly—every letter must be of maximum helpfulness and of maximum value in winning good will.
3. Give all the pertinent facts. The reader has confidence in the man who knows what he is talking about.
4. Letters should be clear and understandable. Every needless word and every word misused, slows down the thought.
5. To write a good letter we need only make sure what we wish to say and say just that, without embroidery.

Remember: Letters are vital. They have saved lives and condemned people to death. They can make friends or lose them.

OUR CHOSEN PROFESSION

A survey was recently made by Arthur W. Towne, Secretary of the Onondaga Health Association of Syracuse, N. Y., to ascertain the extent to which the larger municipal health departments employ health educators, either on a full-time or part-time basis. A questionnaire was sent to health

Please address samples of printed material, comments, or other editorial contributions to the editors at One Madison Avenue, New York, N. Y.

officers in 56 cities of the United States having a population of 150,000 or more. No information was sought concerning persons, whether employed by health departments or by school authorities, charged with health education in schools.

Replies to Mr. Towne's questionnaire were received from the health officer of each of the 56 cities. Just 5 health departments in the entire group reported employment of full-time community health educators. The cities having this service were New York, Boston, Washington, Detroit, and Louisville. In addition, a private foundation, the Clara Elizabeth Fund, furnishes the salary for a trained health educator in the Flint Health Department, Flint, Mich. Three health officers reported the employment of part-time health educators.

Additional data gleaned from the survey showed that persons holding the positions of health educators include both physicians and laymen. New York City and Detroit have well organized health education bureaus, each with about a dozen workers and with annual budgets of \$64,000 and \$40,000 respectively.

All 5 cities having full-time directors of community health education reported the use of the usual media and methods of health education. Their subject matter covers the usual major health problems. The programs differ, however, in the relative extent to which these different avenues of publicity and education are utilized as well as in their relative emphasis upon different problems.

From the foregoing findings, it is apparent that much room exists for further progress on the part of American cities, if they are to live up to ideal standards with regard to community health education. In many places the most active health education service is still rendered by private associations. A conclusion reached through the inquiry

was that health educators should be employed both in governmental and in voluntary agencies.

FOR MOTHERS AND BABIES

Are you familiar with the services of the National Maternal and Child Health Council? This organization functions as an advisory center on problems bearing on the health of mothers and babies. It seeks ways and means of bringing to greater fruitfulness current knowledge and technics related to maternal and infant care, and it acts as a clearinghouse for teaching and publicity materials in this field. The Council does no field or demonstration work, but consultation and active assistance will be given upon request to state and local groups promoting maternal and child care programs. The Council is made up of some sixty member organizations representing many professions.

The Council has compiled very comprehensive catalogues listing the best pamphlet, exhibit, poster, and film materials available on maternal and child care, and is planning study courses suggesting ways in which these materials may be used. Health agencies will find these catalogues very useful.

An interesting leaflet issued bi-weekly by the Council, called "Clearing House Notes," is available free of charge. This publication reports briefly and factually on medical and environmental problems pertaining to mothers and babies. Material in this leaflet may be used in radio addresses, speeches, classroom work, libraries, and "even for effective conversational purposes."

Those interested in learning more of the Council's work and in obtaining its printed materials should address inquiries to Mrs. Gordon Wagenet, Executive Secretary, National Maternal and Child Health Council, 1710 Eye St., N.W., Washington, D. C.

NOTES ON PUBLICATIONS

Health agencies are beginning to focus their attention on appendicitis as a disease that may be subject to control by public health measures. Evidence of this fact comes from the Department of Public Health of the State of Illinois which has published an excellent bulletin on the subject entitled "A Message About Appendicitis." There are certain essential facts about this disease that the public should know—namely, that any stomach-ache may turn out to be appendicitis, that early hospitalization increases the chance of recovery, and that no laxatives should be taken when suspicious abdominal pains persist. These facts are duly emphasized in the Illinois booklet. Conspicuous by its absence is any reference in the text to the application of heat or cold to the abdomen. The consensus among medical authorities is that either practice is harmful, though both are still advocated in some quarters. Now that one health department has taken the lead in spreading information about appendicitis, others should follow suit as the public could be greatly benefited by collaborative efforts between health agencies and the medical profession to control the disease. "A Message About Appendicitis" is available from the State Department of Public Health, Springfield, Ill.

Everyone interested in venereal disease control should read the important report by Maurice A. Bigelow, Ph.D., entitled "Health Education in Relation to Venereal Disease Control Education." This report, which appeared originally in the February, 1941, issue of the *Journal of Social Hygiene*, has been reprinted in booklet form and is now available from the American Social Hygiene Association, 1790 Broadway, New York, N. Y., at 25 cents per copy.

The report is based on a coöperative project conducted jointly by the A.S.H.A. and the U. S. Public Health Service. Dr. Bigelow's very thorough study is based on personal conferences with health officials, physicians, educators, ministers, and parents in 18 states. Additional information from areas outside the 18 selected states was obtained by correspondence. Thus the data presented in this report are comprehensive and enlightening. Among the interesting conclusions presented in this study are: (1) "Direct teaching concerning the venereal diseases as communicable diseases is the most important educational attack, so far as protection of the individual is concerned"; and (2) "... all education which makes for character and understanding of the natural relations of the two sexes is indirectly and in the long run very important for venereal disease control."

First aid training is one of the principal items on the agenda of the Medical Division of the Office of Civilian Defense. Courses are already being given in many localities, and the need for authoritative publications setting forth the essentials of first aid will mount as the government's civilian defense program expands. Hence the first aid booklet of the U. S. Public Health Service comes along at a most opportune time. This publication was recently released under the title "Until the Doctor Comes." It was written by James A. Dolce, M.D. This manual has many admirable features. Practically all the important first aid practices are adequately but briefly covered. There is no extra verbiage in any of the directions, a feature that is highly desirable in a first aid book, where compactness and conciseness are essential if the book is to be used "on the spot" rather than for study. The organization of this publication is another of its admirable

features, as are the various diagrams, which are unusually clear in illustrating the fine points of various first aid technics. The book is also well executed from the standpoint of layout and typography. Copies of "Until the Doctor Comes" are available at 10 cents each, from the Superintendent of Documents, Washington, D. C.

"Sex Education for All Ages" would make an appropriate title for a series of booklets recently issued by the Bureau of Health and Public Instruction of the American Medical Association. The series is composed of five booklets, especially written for different age levels as the following individual titles indicate: Sex Education of the Pre-School Child, Sex Education of the Ten Year Old, Sex Education for the Adolescent, Sex Education for the Married Couple, and Sex Education for the Woman at Menopause. The text of each booklet originally appeared in *Hygeia*. The authors are all well known authorities in the social hygiene field and their treatment of the subject matter is expertly handled so as to provide laymen with practical instruction and counsel. A valuable list of supplementary sources of information is included in each booklet. The booklets, attractively printed and bound, are illustrated with clear anatomical drawings and pleasant photographs. These pamphlets are highly recommended. Priced at 15 cents each, or \$5.00 per 100, they may be secured from the A.M.A. at 535 N. Dearborn Street, Chicago, Ill.

"When Your Child's in the Teens" is the title of a new booklet recently made available by the John Hancock Mutual Life Insurance Company, Boston, Mass. Publications dealing with the "turbulent teens" are always in

demand, and this well written booklet by Edwina A. Cowan, Ph.D., should be most helpful to parents. The author covers the subject thoroughly, and the sections on security, temperament, and love affairs are particularly good. We wonder why the all-important matter of rest was omitted. The final paragraph in this publication is worth quoting: "To put the whole matter in a nutshell, infinite patience, outspoken confidence in each other's judgment, and sympathetic understanding of the fine problems involved, those are the tools with which parents may most successfully help their children through the turbulent teens." The booklet is available without cost.

A "MUST" ITEM

"An editorial achievement" — this phrase could be aptly applied to practically any issue of *Consumers' Guide*, a publication of the U. S. Department of Agriculture. The June-July, 1941, issue, however, more than fulfils the expectations of readers who follow this publication regularly. A reportorial job of such general excellence is not often encountered and "Credit Lines" is happy to commend the individuals who are chiefly responsible for *Consumers' Guide* — D. E. Montgomery, *Consumers' Counsel*, and Mary Taylor, Editor.

The June-July issue is devoted to the National Nutrition Conference which the President called in Washington last May. By means of excerpts from the various papers and speeches presented at the conference, readers are given an excellent summary of the scope of the nutrition problem and the responsibility that must be met by many diverse groups, if "we are to have a people who have enough to eat." There has been no better popular presentation of the facts about nutrition than in this publication. The text is enhanced considerably by a series of well chosen photographs.

Consumers' Guide may be obtained from the Superintendent of Documents, Washington, D. C., at 5 cents per copy, or by subscription at 50 cents a year. Every health worker should have access to this journal.

RE: "LISTEN, AMERICA"

The favorable reception accorded the series of radio programs "Listen, America," which were broadcast weekly during the summer by NBC, has resulted in the continuation of this series on the air. Readers who heard the original programs will recall the effective dramatizations of outstanding achievements in nutrition which this series featured. After a brief absence from the airways, "Listen, America" was resumed on October 19 and is to continue over the Red Network of NBC each Sunday for thirteen consecutive weeks. The program is broadcast from 3:30 o'clock to 4 o'clock, Eastern Standard Time.

The programs are given under the auspices of the Women's National Emergency Committee, the U. S. Public Health Service, the U. S. Department of Agriculture, and the Federal Security Agency. The original plan of the program is being followed in the new series, which calls for the weekly appearance of leading authorities in nutrition and "guest stars" from the stage, the screen, and other fields.

The programs stress the fact that good health and full strength are based on good food. The scope of future programs will be broadened to embrace topics related to morale and the general welfare of the American people. The theme for all the programs in this series stems from Surgeon General Thomas Parran's statement: "Food will build a better America."

Readers are urged to tune in on "Listen, America." The programs have been enthusiastically endorsed by many

authorities and the public's response indicates that the broadcast are a hit.

A NEW FILM PROJECT

The American Film Center, 45 Rockefeller Plaza, New York, N. Y., has announced the establishment of a section on films in health education, with Adolph Nichtenhauser, M.D., in charge.

The new section will be a clearing-house and information center on the use and production of health education and medical films. Through this section the American Film Center will evaluate existing health films in collaboration with health experts and publish from time to time lists of recommended films. Cooperation with the many groups using health films will be sought in order to create a solid economic basis for their production. A long-range production program will be developed in collaboration with competent agencies.

Attention will also be paid to the technical medical film, especially with regard to its use in medical schools. From its beginning the American Film Center has cooperated with medical and scientific agencies, such as the Wistar Institute of Anatomy and Biology in Philadelphia, and various hospitals in New York and New England, in the study and production of films.

Dr. Nichtenhauser has been working in educational cinematography for many years. Before joining the Center he was on the staff of the National Tuberculosis Association and of the New York Tuberculosis and Health Association, where he worked on health films. The Section on Health and Medical Films has received a 3 year grant from the Rockefeller Foundation.

MAGAZINE ARTICLES

Current popular magazine articles on health or of medical import:

- "Physical Fitness and the Draft." Nathan Sinai. *Harpers Magazine*, October, 1941
- "Camp Followers of the Army." Gretta Palmer. *Ladies Home Journal*, October, 1941
- "I Collect People." Paul de Kruif. *Ladies' Home Journal*, October, 1941
- "What a Woman Obstetrician Does." No Author listed. *Good Housekeeping*, October, 1941
- "Anemia." Maxine Davis. *Good Housekeeping*, October, 1941
- "Worry Goes to the Stomach." Helen Haberman. *Cosmopolitan Magazine*, November, 1941
- "And Still They Die." Arthur Bartlett. *Woman's Home Companion*, October, 1941
- "Are You Really Getting Your Minerals?" Donald G. Cooley. *Better Homes and Gardens*, September, 1941
- "It May Be Allergy." Lois Mattox Miller. *Better Homes and Gardens*, September, 1941
- "Is There New Hope for Epileptics?" W. W. Bauer, M.D. *The American Mercury*, October, 1941

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

JOTTINGS

Did you see "Know for Sure," a film on venereal disease, during the Association Annual Meeting? This is the first health film in which Hollywood producers have collaborated. This picture was made by 20th Century-Fox from a script developed by the U. S. Public Health Service, and a professional scenario writer, John Sutherland. Lewis Milestone, one of Hollywood's leading directors, is in charge of production. The film will be made in Spanish and Portuguese versions for showing in Latin American countries. "Know for Sure" was enthusiastically received by A.P.H.A. audiences in Atlantic City. . . . The Bureau of Social Hygiene of the Department of Health of New York City is distributing an interesting publication entitled "Hall of Fame in Social Hygiene." This leaflet deals with the historical aspects of syphilis from the

time of Columbus to the time of Ehrlich. . . . The September, 1941, issue of *The Journal of Pediatrics* contains a wealth of material on adolescence that will be particularly valuable to school health workers. Authoritative papers covering practically all the medical and psychological aspects of the adolescent years are found in the *Journal*. . . . Speaking of slogans (as we were in the last issue) the following is being used by one of the government agencies:

"A pig,
A cow,
24 chickens and a rooster
And you'll live better than you uster." . . .

Publishers' fall lists of forthcoming books bristle with titles of interest to public health workers: "Lifting the Shadow" by Parran and Vonderlehr, "Behind the Mask of Medicine" by Miles Atkinson, and biographies of the Mayo Brothers, William Henry Welch, and William Hallock Park. . . . *Life Magazine* (issue of September 29, 1941) published an excellent photographic essay on "First Aid." The "strawberry jam" pictures were unusually realistic and no doubt gave many a layman a good idea of the unpleasant sights that a first aid worker must calmly face. . . . Joke of the Month: A popular booklet on venereal disease distributed by the Metropolitan Life Insurance Company is called "The Great Imitator." A policy holder, seeing the booklet on display in a reception room, asked for a copy. "I want to take this home to my husband," she remarked, "may help him improve his imitations of Jack Benny and Fred Allen." . . . A splendid example of community coöperation in a health campaign is reported by John St. Peter of the Pittsburgh Syphilis Control Project. With the assistance of the WPA, an advertising agency, and a transportation company, syphilis posters were placed in every street car and bus operating in the city. It is reported that not one complaint was received and

that the publicity resulted in a noticeable increase in the patient load at local clinics, which were mentioned on the poster. . . . Have you seen any of the arresting photographs of bacteria made by means of the electron microscope? Health publications can certainly make use of these as the public always wants to know what this or that germ "looks like." . . . Recommended reading: "America in a World at War" by Clifton M. Utley in the October, 1941, issue of the *Journal of Home Economics*. . . . Just as we go to press, the 1940 annual report of the New York City Department of Health reaches us. While we have not yet had time to read this volume carefully, we can say that it makes a most favorable impression,

being attractively bound and illustrated, and evidently written in a style that is not only intelligible for the lay citizen, but that interprets in a human fashion the tremendous variety of scientific and educational activities of this great Department of Health. No doubt the report, approaching 300 pages in length, will be more extensively reviewed subsequently in this JOURNAL. Our congratulations to Commissioner Rice! . . . Quotation of the Month: "If we replace an *average* diet with an *adequate* diet, we get a 10 per cent increase in the active virile life span. This would mean more in terms of human longevity than to wipe out cancer as a cause of death." (From a speech by Surgeon General Parran.)

BOOKS AND REPORTS

The Analytical Chemistry of Industrial Poisons, Hazards and Solvents—By Morris B. Jacobs, Ph.D. New York: Interscience Publishers, Inc., 1941. 661 pp. 110 text-figs. Price, \$7.00.

Along with the great technological advances of the past quarter of a century there has been a quickening of interest in the health of the worker and increasing study has been made of his environmental conditions. Prevention rather than cure has come to be the accepted point of view.

An important division of industrial hygiene is that of industrial poisons, the recent growth of which is well indicated by the ground covered in *Analytical Chemistry of Industrial Poisons, Hazards and Solvents*. This book is written primarily for the analytical chemist in the field of industrial hygiene and is therefore largely a collection of methods of analysis. However, much incidental information is given with respect to the physiological response to and toxicity of harmful dusts, fumes and vapors, which makes the book of value to all industrial hygienists.

Roughly the book is divided into three sections comprising Sampling, Gas Measurement and Dusts (159 pages); Inorganic Industrial Poisons (199 pages); and Organic Industrial Poisons (257 pages). This summary appraisal gives a very inadequate idea of its scope, however. The 19 chapters discuss in succession a long and imposing list of industrial poisons and their analytical determination, with a final chapter devoted to chemical warfare agents. There are 18 pages of tables in the appendix, ranging from conversion tables for gases to safe con-

centration limits for industrial dusts. The literature has been particularly well reviewed with reference to analytical procedure. Wherever possible several methods of evaluation are given and these methods are described in detail. The extensive amount of information thus made available should be of the greatest assistance not only to the chemist but to all those interested in industrial poisons.

The book is well indexed, clearly printed, and amply illustrated.

L. T. FAIRHALL

A Manual of Allergy—By Milton B. Cohen. New York: Hoeber, 1941. 156 pp. Price, \$2.00.

The author explains the writing of this book in the fact that while there are satisfactory large texts on the subject for the use of allergists, and while there are popular books through which the layman can understand allergy, there is need for an intermediate volume which will serve the medical man whose interest is only secondary and who does not wish to burden himself with extensive reading of the large volumes.

Dr. Cohen's many important contributions to the subject give to his writings a generally recognized authoritativeness.

The book is well written and covers the subject excellently to the extent that general practitioners and non-medical persons as well can gain a clear understanding of the processes of allergy. One is left with the feeling that Dr. Cohen would have done well to have enlarged it a little more with detailed discussion of the routines of specific diagnosis and treatment. One who has read the book and desires to proceed

with allergic studies must still refer to the larger volumes. Although it would be desirable to have it all in one book, there is justification for the author's plan of presentation, in that those who actually wish to use allergic procedures should become acquainted with intricate details as well as with general principles. This certainly should make for better allergic practice.

In this sense we might consider the present volume as an Introduction to Allergy.

WARREN T. VAUGHAN

A Yankee Doctor in Paradise—
By S. M. Lambert, M.D. Boston: Little, Brown, 1941. 393 pp. Price, \$3.00.

This book is well worth reading from a dozen different standpoints. The author was sent by the Rockefeller Foundation to tackle hookworm, first in Papua, but spent 21 years in the South Sea Islands, going to many. He did not confine himself to hookworm. As a book of adventure, it is a fascinating story. However, our chief interest lies in the public health aspect and the great work which was carried out under the Rockefeller Foundation and largely by funds supplied by it. On some islands he was ably seconded by the English Commissioners and medical officers. One must admire the vision which led the Foundation to undertake the problem of cleaning up the South Sea Islands or even making a survey of the many ills which affect the natives. Accomplishments have equalled the vision.

The author gives us a good deal of anthropology, ethnology, comments upon social customs, trading, missionaries, superstitions with ghosts and black magic, which are interesting in themselves and have had much to do with the health of the natives and their acceptance or rejection of modern medicine.

Outstanding is the discovery of Maurice C. Hall, U. S. Bureau of Ani-

mal Industry, published in November, 1921. *Chenopodium* had been the sole "cure" for hookworm, but all workers were becoming disappointed, and Dr. Gilbert was at his wit's end, when like a voice from Heaven came this article in the *J.A.M.A.*, "The Use of Carbon Tetrachloride in the Removal of Hookworm." Though the Foundation cabled him, "Forbid use. We do not experiment with human life," he was able to try it through the coöperation of the Chief Medical Officer, Dr. Aubrey Montague. Medically this was the great answer to the hookworm problem. Unfortunately, in telling the story he says we must remember that "modern anesthesia originated in a dentist's brain," giving credit to Morton for a discovery which belongs to Dr. Crawford Long, of Georgia.

Sketches are given of the inhabitants of various islands. Many of these the author places very high physically, morally, and intellectually. He puts the Fijians, "Natives of the Cannibal Islands," at the top. Their rapid advance "From Cannibalism to Calvinism" is remarkable and he gives delightful sketches of their character. One of the author's great accomplishments was the establishment of a medical school in Suva. He gives charming pictures of Fijians who became skilled surgeons and suggests that this flair is due to their former cannibalism since cannibals are anatomists "and their gruesome habits made them familiar with the set-up of the human body. . . . Neither ways were pretty roads to knowledge, but strange things have happened in the Martyrdom of Man."

These people are naturally hospitable and delightful, splendid physically as well as mentally. Their kindly natures have had much to do with their physical downfall and the author repeatedly says that the main cause of the depopulation in the Pacific is the introduction of diseases to which the natives have no

immunity. "Epidemics are the fruits of island hospitality." Cannibalism and head-hunting were rough blessings because they quarantined tribe against tribe. Missionaries and tradesmen have done too much in introducing disease. "... witness once more the greasy Mother Hubbards, layer on layer, pressing oil and germs into their beautiful bodies." He does not believe that the missionaries have succeeded in Christianizing these people, not even the Fijians. "Christianity had its place—it was 'society,' . . . It had an amusement value." He quotes a missionary on Trobriand Island, a graduate of Oxford, as saying he had made not one convert in 20 years, but this man has done a splendid work in civilizing and educating.

While for certain of the natives, notably those on the Island of Tahiti, which he did not visit, seem doomed to extinction, for others the outlook seems good. The formula is native doctors and nurses to treat disease and teach prevention, especially soil sanitation by proper care of the discharges from the body, and pure water supplies, all under the supervision of competent European physicians and nurses. There must also be a careful study of native customs and "respect for the more wholesome of the folk ways that have given life's zest to these people." In the past civilization has been a very doubtful blessing to the South Sea Islands, but the dawn of public health and modern medicine seems to have made the future hopeful: Civilization has given them venereal diseases, hookworm, tuberculosis, and leprosy. Yaws is widely prevalent but is being conquered by salvarsan.

The book is delightfully written. The author has a keen sense of humor, is a philosopher, and a good deal of a poet. Some of his descriptions are beautiful. He confesses to a homesickness whenever he thinks of Fiji, which has the most perfect climate in the world. The

book is a fit companion piece to Heiser's *An American Doctor's Odyssey*, and can be recommended to every class of reader.

MAZÛCK P. RAVENEL

Training and Efficiency — *An Experiment in Physical and Economic Rehabilitation—By Johl, Chiver, Goldvolk, and DeJongh. Johannesburg: South African Institute for Medical Research, 1941. 188 pp.*

A group of some 14,000 unemployed young men went to a training camp and for the first time in their lives experienced a régime of strict discipline. For six months "they lived in well-kept tents and barracks; slept in proper beds; received a well-balanced diet; had to follow a carefully elaborate timetable, which set aside ample time for recreation." They received 3 hours of physical training per day.

After the first month they liked it.

What happened to them physically?

Thirty-two young men were selected as indicators. Anthropometric and performance tests were given. The story of change at 6 week intervals may be read from the many tables and charts.

Marked improvement in body functioning occurred. Significant is the fact that long periods of rigid drill in the hot sun were altered as a result of the evidence accumulated. Instead more stress was laid on "free movements and play activities."

A conclusion is reached that a low standard of fitness and efficiency "is not due to a basic biologic defect, but that it is largely the expression of environmental shortcomings." And this is changeable. National planners may well ponder over these results, war or no war.

Army camp commanders and physical educators should welcome this report. It is splendid, packed full of carefully drawn dependable data that go far toward satisfying a longing for some objective measurements of changes in health.

GEORGE T. PALMER

Biological Symposia—Volume II
—*Edited by Jaques Cattell. Lancaster, Pa.: Jaques Cattell Press, 1941. 270 pp. Price, \$2.50.*

The second volume in the series of Biological Symposia includes a number of separate symposia on: (1) Speciation, (2) Defense Mechanisms in Plants and Animals, (3) Biological Basis of Social Problems, and (4) Regeneration. In the first symposium "Speciation" is defined as the process by which new species develop (p. 60), and a careful analysis is made of the meaning of the term "species." The whole symposium is well summarized by Dobzhansky (p. 122): "By speciation is meant the fixation of discontinuity among organism. Discontinuity is maintained by isolating mechanisms that prevent the interbreeding of carriers of different adaptive complexes of genes."

The second symposium is made up of three papers on defense mechanisms in plants and animals. The first discusses local reactions in plants, the second generalized defense reactions in plants, while the third describes defense reactions in animals. To a student of human disease the first two papers should prove extremely interesting. In the third symposium there is much of a controversial nature, as might be expected from the subject. An example is Child's attempt to picture social integration as a biological process, which involves classifying stages of biological evolution as "communistic," "autocratic," and "democratic" (p. 177).

The fourth symposium on Regeneration, deals solely with invertebrate forms, but can be read with interest by most physicians. HERBERT HOFF

Biological Symposia — Volume III, Muscles—*Edited by Jaques Cattell. Lancaster, Pa.: Jaques Cattell Press, 1941. 370 pp. Price, \$3.50.*

This volume is an expansion of papers presented at a symposium on

muscle physiology organized by Prof. W. O. Fenn for the annual meeting in 1940 of the American Physiological Society. It presents the specialized viewpoints of a number of the most active workers in the field of muscle physiology, and is a volume of great importance to other students of that subject. The subject of the electrical activity of muscle is especially well treated in a number of papers, and transmission at the neuro-muscular junction continues to be the subject of lively controversy. A notable feature is the attention given to smooth muscle, which has been too readily dismissed in the past. The implications of Astbury's work on protein structure in relation to muscle contraction are ably discussed. The chemistry of muscular contraction has been neglected purposely, but an interesting chapter by Meyerhof is included, entitled "The significance of oxidations for muscular contraction." Readers of this chapter will probably keep in mind Millikan's paper in *Physiological Reviews* for July, 1940. There is a most stimulating chapter on electrolyte equilibrium in muscle.

The point of view that makes this volume so very interesting to the physiologist interested in muscle renders it somewhat less adequate as a general account of muscle physiology, and limits its value to the general reader and the beginning student. HERBERT HOFF

Papers of Wade Hampton Frost, M.D. A Contribution to Epidemiological Method—*Edited by Kenneth F. Maxcy, M.D. New York: The Commonwealth Fund, 1941. 628 pp. Price, \$3.00.*

Here is a book that does not need a review, and indeed one would have to be bold to attempt either a review or a criticism. All it needs is a notice of its publication.

A short Preface tells us that Dr. Frost made no collection of his writings,

which, however, seemed of so much importance, both in themselves and also in representing the evolution of epidemiology, that a group of his associates and former students have selected from his published papers a certain number, have arranged them in groups which illustrate the methods practised and taught by the author and which have had such an outstanding influence on the conception of epidemiology, not only in this country but in others.

The book opens with a paragraph defining epidemiology in Dr. Frost's own words found in an introduction to the reprinting of the papers by Dr. John Snow in 1853-55. We know of no better definition that has been given.

These papers have been collected not only as a labor of love on the part of associates and students, but, as said in the title, as a "contribution to epidemiological method" and to illustrate "the extent to which his work and teaching had contributed to the transformation of epidemiology from a speculative and descriptive methodology to an analytic and productive science. . . ." The purpose of this book is to perpetuate Frost's influence and teaching. The papers are on various subjects and "though diverse in nature, they reflect the ever-increasing care and precision with which he ordered evidence, his capacity to use numbers effectively in reasoning, and the progressive clarification of his philosophical concepts."

Following this lucid exposition of the motives and methods which dominated Frost's work, the Introduction gives an understanding sketch of his life and work, tells how he progressed from one phase of his work to another, and gives the names of many of those with whom he came in contact and who influenced the trend of his interests and work.

Whatever might be written in the way of a review of this book could be little more than an abstract of the excellent introduction with its faithful

picture of the development of an orderly and critical mind and the expanding interests of a character which made him from the beginning of his career an outstanding figure. Without belittling the excellent and pioneer work of his associates, it is safe to say that no single man made a greater impress on the development of epidemiology than did Dr. Frost.

One must acknowledge a debt of gratitude to the editor and the group who worked with him, and to the Division of Publications of the Commonwealth Fund for making this book available. An unfortunate error is found in a footnote on page 5, where Sir Rupert Boyce is referred to as Robert Boyce. The reference is otherwise correct. With this exception the printing and make-up are excellent.

MAZYCK P. RAVENEL

Doctors Don't Believe It—Why Should You?—By August A. Thomen. *New York: Simon & Schuster, 1941.* 384 pp. Price, \$2.50.

In an introduction to this new attempt to tell the public what it should know about health and disease, Dr. Logan Clendening appropriately quotes the saying "People will tell you that the truth is simple. Half truths are simple. The whole truth is the most complicated thing in the universe." On this thesis Dr. Thomen has tried to explode many popular fallacies and at the same time, having shown the untruth in the half truth, has attempted to give the reader something of the whole truth.

Obviously, the choice of subjects for such a book is a problem. Here there are ten chapters: on (1) food diet and weight reduction, (2) your daily life, (3) major ailments, (4) venereal diseases, (5) cancer, (6) the common cold, (7) allergy, asthma and hay-fever, (8) minor ailments, (9) mind and senses, (10) birth, marriage and death. In

each a variety of questions are asked: How "whole" is whole wheat bread? How beneficial is suntan? Of what importance is the typing of pneumonia? Is it more dangerous to prick oneself with a pin than with a needle? What are the principles underlying the treatment of tuberculosis? The answers are given in relatively simple, straightforward language with not too obvious attempts to popularize or brighten the topic under consideration. Sometimes the wealth of medical terminology used would seem overpowering, again one wonders why more is not included—but in the main a happy balance has been reached.

There are references to interesting historical, epidemiological, and cultural facts, and sometimes reference is also made to sources for additional information—books, agencies.

A bibliography of 70 volumes is included but, arranged as they are in alphabetical order by author's name, and ranging from the almost inaccessible first Verona edition of Fracastoro's "*Syphilis sive morbus Gallicus*" to a 1938 volume entitled "The Story of Human Error," one wonders how the layman for whom the book is intended can use these references. And, although the questions are asked in a layman's language, the index has been built up around the names of authorities cited or medical terms used so that the layman will probably find it less useful than the text.

It is interesting to note that even the professional person may find some of his pet fallacies laid bare if he goes through the text carefully.

LEONA BAUMGARTNER

Tuberculosis Nursing — By Grace M. Longhurst. Philadelphia: Davis, 1941. 280 pp. Price, \$3.00.

Although written primarily for student nurses, this book should be invaluable to all nurses as a reference on

modern diagnostic and therapeutic procedures in the treatment of tuberculosis. The concise definitions and descriptions of treatments will be appreciated by public health nurses as well as hospital nurses. The book provides too a simple interpretation of scientific information, so is essential to nurses in teaching the lay public facts about the disease and its treatment.

Effective use has been made of isotype graphs provided by the National Tuberculosis Association, and pictures of equipment treatment procedures, and record forms. Bibliographies and review questions at the end of each unit provide stimulation for those who wish to continue their study of this important disease.

The need for an understanding of the psychological approach to the patient's problems has been illustrated by a series of brief case histories. Interesting though these are, it is to be regretted that this important phase of the nursing care of the tuberculosis patient has been treated with such brevity. Also, greater emphasis might well have been given to the importance of the nurse's knowledge of social agencies in the successful treatment and rehabilitation of the tuberculosis patient. Teaching by inference is not always the most successful method of presentation of subject matter. However, the author no doubt rightly assumes that instructors in schools of nursing will give student nurses specific assistance in the utilization of community resources as individual cases come under their care.

Certain it is that any nurse who familiarizes herself with the content of this book will possess not only a more thorough understanding of how to protect herself as well as others from the successful invasion of tubercle bacilli but also a greater ability to present simply the scientific facts about tuberculosis and its various treatments.

MARIE L. JOHNSON

How to Help Your Hearing—By Louise Neuschutz, Foreword by Walter B. Pitkin. New York: Harpers, 1940. 179 pp. Price, \$2.50.

This is a sensible, practical book with a hopeful outlook. Availing herself freely, as her well digested bibliography indicates, of what has been written by her predecessors in the field, Mrs. Neuschutz has yet written a study that is not purely derivative. She discusses the problems introduced by a hearing loss and outlines in an intelligent and sympathetic manner the ways in which each may be faced and, to some extent, overcome. She deals with lip-reading, the choice of a hearing-aid, the adjustments necessary in social life and in the eco-

nomic field, and opens vistas of the surprisingly ample modes of successful adjustment and self-expression that still remain for the handicapped. There are useful suggestions for the preservation of residual hearing and of the speaking voice, and, what is even more important, of morale and mental and physical alertness.

Chapters of advice to the parents of a deafened child and to normal people who have hard of hearing friends are included, and there is an appendix with standard acoustic drills for home practice. Mrs. Neuschutz has a helpful message for those about to take the first steps that lead to rehabilitation.

REGINALD M. ATWATER

BOOKS RECEIVED

HIPPOCRATIC MEDICINE. ITS SPIRIT AND METHOD. By William Arthur Heidel. New York: Columbia University Press, 1941. 149 pp. Price, \$2.00.

COMMUNICABLE DISEASE CONTROL. By Gaylord Anderson and Margaret Arnstein. New York: Macmillan, 1941. 434 pp. Price, \$4.25.

THE ESSENTIALS OF OCCUPATIONAL DISEASES. By Jewett V. Reed and A. K. Harcourt. Springfield: Thomas, 1941. 225 pp. Price, \$4.50.

HOUSING YEARBOOK 1941. Coleman Woodbury and Edmond H. Hoben, Editors. Chicago: National Association of Housing Officials, 1941. 405 pp. Price, \$3.00.

PUBLIC HEALTH NURSE IN ACTION. By Marguerite Wales. New York: Macmillan, 1941. 437 pp. Price, \$2.75.

THE 1941 YEAR BOOK OF PUBLIC HEALTH. J. C. Geiger, Editor. Chicago: Year Book Publishers, 1941. 544 pp. Price, \$3.00.

ORIENTATION IN SCHOOL HEALTH. By Clair V. Langton. New York: Harper, 1941. 680 pp. Price, \$3.00.

THE PREMATURE INFANT. By Julius H. Hess and Evelyn C. Lundeen. Philadelphia: Lippincott, 1941. 309 pp. Price, \$3.50.

FATAL PARTNERS: WAR AND DISEASE. By Ralph H. Major. New York: Doubleday Doran, 1941. 342 pp. Price, \$3.50.

THE MAN WHO LIVED FOR TOMORROW. A Biography of William Hallock Park, M.D. By Wade W. Oliver. New York: Dutton, 1941. 507 pp. Price, \$3.75.

THE VOLUNTEER IN PUBLIC HEALTH NURSING. Prepared by Evelyn K. Davis. New York: National Organization for Public Health Nursing, 1941. 48 pp. Price, \$.50.

NUTRITION IN EVERYDAY PRACTICE. Series of articles and addresses taken from the Canadian Medical Association Journal, 1938-1939. Evansville: Mead Johnson & Co., 1939. 94 pp. Free.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Industrial Health Pays Dividends

—One hundred and sixty million man-days are lost through illness each year or, in terms of industrial wages, three-quarters of a billion dollars. A committee of the N.A.M. reports upon current industrial health services. You'll go far to find so much information packed into ten pages.

ANON. *Industrial Health Practices*. Ind. Med. 10, 9:388 (Sept.), 1941.

Children's Disease Attacks Adults

—In busy, growing Halifax an outbreak of diphtheria made life a nightmare for medical and health authorities in the winter of 1940-1941. A large number of adults were attacked, though the mortality rate among them was much lower than that in children.

CAMPBELL, P. S. The Occurrence of Diphtheria in Halifax from October 1, 1940 to January 31, 1941. *Canad. Pub. Health J.* 32, 8:404 (Aug.), 1941.

Philosophy of Public Hygiene—

If all research in medical sciences ceased, but the fullest use of current knowledge were applied by an eager and informed public, then would come almost unimaginable improvements in the health of Canada. This is only one of many provocative assertions in this inclusive state paper whose scope is indicated by its title.

DOLMAN, C. E. The Health of the Nation. *Canad. Pub. Health J.* 32, 8:387 (Aug.), 1941.

For Complacent H. O's—Care of mothers and babies in prosperous, fortunate America is compared with that in war-torn England. If you think that we must do better over here with all the

means we have at hand, then don't fail to read this address to a class of graduating women physicians.

ELIOT, M. M. The Protection of Children in a National Defense Program. *Med. Woman's J.* 48, 8:242 (Aug.), 1941.

Influenza A—A complex influenza virus vaccine increases the antibodies against influenza A, and this results in a useful immunity against this type of influenza. Unfortunately, influenza of other known and unknown types is not affected by this vaccine. That part of the public which has heard about this new protective measure is sure to be disappointed.

HORSFALL, F. L., *et al.* Studies in the Efficacy of a Complex Vaccine Against Influenza A. *Pub. Health Rep.* 56, 38:1863 (Sept. 19), 1941.

More About Nurses and Tuberculosis—Half the student nurses admitted to this Philadelphia hospital were tuberculin-positive and all were in this condition at the close of training. Tuberculous lesions developed later in 5 per cent of the students originally tuberculin-negative. Among the originally tuberculin-positive, the later attack rate was 4 per cent (not a statistically significant difference). There is a lot more in this excellent paper.

ISRAEL, H. L., *et al.* A Study of Tuberculosis Among Students of Nursing. *J.A.M.A.* 117, 10:839 (Sept. 6), 1941.

Some Epidemiologic Inferences About TB—At the turn of the century when the tuberculosis death rate was above 200, the risk of death among those infected was about 2-2.8:1,000.

Now, when the death rate is lower than 50 the risk of death among the infected has been halved. The conclusion is advanced that the decreased mortality is caused equally by the reduction in sources of infection and by better care. This is reassuring in the light of some recently expressed doubts about the real effect upon tuberculosis mortality of our modern treatment methods.

LANDÉ, K. E., and WOLFF, G. Frequency of Tuberculous Lesions at Autopsy. *Am. Rev. Tuberc.* 46, 2:223 (Aug.), 1941.

The Hodge-Podge That Is Health Administration—This introductory chapter to a survey of official state health administrative services is not to be missed. As many as 18 separate agencies contribute to health activities in one state, in none are there less than six. The median number is 11 per state. How the more than \$285,000,000 are spent presents an amazing picture.

MOUNTAIN, J. W., AND FLOOK, E. Distribution of Health Services in the Structure of State Government. *Pub. Health Rep.* 56, 34:1673 (Aug. 22), 1941.

Protection Against Tetanus—Most children who failed to achieve satisfactory immunity to diphtheria and tetanus after two doses of the combined toxoids, did so after a third or "repeat" dose. There is a limit beyond which multiple injections fail to increase immunity.

PESHKIN, M. M. Immunity to Tetanus Induced by Combined Alum Precipitated Diphtheria and Tetanus Toxoids. *Am. J. Dis. Child.* 62, 2:309 (Aug.), 1941.

Scarlet Fever Control—Advocated for the more effective control of scarlet fever are: tests of susceptibility and

cultures from contacts, the passive immunization of all about to become ill, and later the active immunization of these, and the immediate immunization of all susceptible contacts.

RHOADS, P. S., *et al.* Management of Scarlet Fever Contacts. *J.A.M.A.* 117, 13:1063 (Sept. 27), 1941.

Flu Unknowns—Most of what we don't know about the immunology of influenza is glumly paraded for the good of our scientific souls. Though antibodies in the blood and susceptibility to known strains bear some relationship, there is much that can't yet be explained.

RICKARD, E. R., *et al.* The Correlation Between Neutralizing Antibodies in Serum Against Influenza Viruses and Susceptibility to Influenza in Man. *Pub. Health Rep.* 56, 37:1819 (Sept. 12), 1941.

By Way of Introduction—In a state village for the feeble minded some of the inmates have been immunized against pneumonia and influenza. This first paper tells about the planning and carrying out of what promises to be a most significant demonstration. Unfortunately you must wait for succeeding installments to get the whole story.

SIEGEL, M., AND MUCKENFUSS, R. S. A Study on Active Immunization Against Epidemic Influenza and Pneumococcus Pneumonia at Letchworth Village. *Am. J. Hyg.* 34, 2:39 (Sept.), 1941.

National Defense Against V. D.—Eight timely papers present as many aspects of the recently aggravated problem of prostitution created by our mobilization of a new army.

SNOW, W. F., *et al.* The Attack on Commercialized Prostitution. *J. Social Hyg.* 27, 7:317 (Oct.), 1941.

ASSOCIATION NEWS

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THE ANNUAL MEETING IN 1942 WILL

BE HELD IN

ST. LOUIS, MO.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Felix Alfaro-Diaz, M.D., 22 Feria St., Santurce, Puerto Rico, Medical Officer, Public Health Unit

Antonio Arbona-Vazquez, M.D., Condado St., Santurce, Puerto Rico, Chief, Bureau of Malaria Control, Dept. of Health

Manuel B. Berrios, M.D., L. M. Rivera, Yabucoa, Puerto Rico, Health Officer-Chief, Public Health Unit, Dept. of Health

Donald J. Bourg, M.D., 510 Court St., The Dalles, Ore., Medical Director, Wasco-Sherman Public Health Dept.

Edelmiro J. Caban, M.D., Mendez Vigo 93, Mayaguez, Puerto Rico, Physician, Tuberculosis Center

Ramon T. Colon, M.D., Puigduller 2, Santurce, Puerto Rico, Director, Mayaguez Sanatorium and Tuberculosis Center

Edward Danforth, M.D., 51 West Main St.,

Bainbridge, N. Y., Health Officer, Consolidated Health District

Juan del Rio, M.D., Main St., Morovis, Puerto Rico, Medical Officer, Health Dept.

William Fernhoff, M.D., Sullivan County, Woodridge, N. Y., Health Officer, Woodridge Health District

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Jose A. Hernandez-Matos, M.D., Sol 30, Ponce, Puerto Rico, Assistant Chief, Sanitary Inspection Bureau, Insular Health Dept.

Jose A. Hernandez-Rivera, M.D., Dr. Cueto St., Utuado, Puerto Rico, Chief, Public Health Unit, Dept. of Health

Vera A. Joseph, M.D., P. O. Box 7083, Santurce, Puerto Rico, Director, Centro Anti-Tuberculosis, Rio Piedras, Dept. of Health
Edward C. Kienzle, M.D., 504 Fourth St., Monett, Mo., District Health Officer, State Board of Health

Jack B. Kodesh, M.D., Box 3758, Santurce, Puerto Rico, Chief, Public Health Unit
Hilton L. Lopez, M.D., P. O. Box E, Guayama, Puerto Rico, Chief, Public Health Unit
Pedro S. Malaret, P. O. Box 326, Rio Piedras, Puerto Rico, Assistant Commissioner, Insular Dept. of Health

Rafael Maldonado-Quinones, M.D., 14 Hospital St., Santurce, Puerto Rico, Medical Officer, Venereal Disease Clinic

Joseph D. Martin, Jr., M.D., Box 111, Winnfield, La., Director, Winn-Jackson Bi-Parish Health Unit

Jose Nadal-Grau, M.D., 5 Libertad, Mayaguez, Puerto Rico, Health Officer, Public Health Unit, Dept. of Health

Domingo Nochera, M.D., Ensanche Martinez, Mayaguez, Puerto Rico, Medical Officer, Public Health Unit, Dept. of Health

Guillermo Ortiz-Guzman, M.D., 3 Ave. Fernandez, Santurce, Puerto Rico, Inspector of Public Health Units

Miguel A. Pastrana, D.D.S., Munoz Rivera, Rio Piedras, Puerto Rico, Dental Surgeon, Public Schools of Rio Piedras

Ernesto Quintero y Fernandez Vanga, M.D., Americo Salas 4, Santurce, Puerto Rico, Director, Bureau of Venereal Diseases

William Reichard, M.D., 35 Comercio St., Aguadilla, Puerto Rico, Medical Officer, Public Health Unit, Dept. of Health

Antonio R. Reyes-Chicano, M.D., Box 3712, Santurce, Puerto Rico, Venereal Disease Physician, Dept. of Health

Pascual A. Rivera-Porrato, M.D., Mattei Lluberas St., Yauco, Puerto Rico, Health Officer, Insular Dept. of Health

Elvira Rodriguez del Valle, M.D., Roosevelt 33, Ponce, Puerto Rico, Health Officer, Public Health Unit

Francisco Ruiz de Porras, M.D., Hato Rey, Puerto Rico, Health Officer, Dept. of Health

Luis A. Sanchez, M.D., Corcega, Rincon, Puerto Rico, Medical Officer, Public Health Unit, Aguada Dept. of Health

Robert B. J. Schoch, M.D., 101 E. Tenth St., St. Paul, Minn., Chief Health Officer, St. Paul Dept. of Health

Patrick J. Sullivan, M.D., Dept. de Sanidad, Santurce, Puerto Rico, Dept. of Tuberculosis

Rafael A. Timothee, M.D., Box 413, San Juan, Puerto Rico, Health Officer, Dept. of Health

Jose R. Villamil, M.D., Taft 56, Santurce, Puerto Rico, Medical Officer, Health Dept.
Duane B. Walker, M.D., 3 E. Main St., Waterloo, N. Y., Health Officer

Laboratory Section

Jorge Bird, M.D., Public Health Unit, Rio Piedras, Puerto Rico, Inspector

Richard T. Carey, B.S., State Board of Health, Pierre, S. D., Bacteriologist

Colonel Virgil H. Cornell (U.S.M.C.), Headquarters, Laboratory Dept., San Juan, Puerto Rico, Command, Puerto Rican Dept. Laboratory, U. S. Army

Lieut. Gustave J. Dammin, M.D., School of Tropical Medicine, San Juan, Puerto Rico, Bacteriologist and Serologist, Puerto Rican Dept. Laboratory, U. S. Army

William J. Kuhns, B.S., 928 Tilghman St., Allentown, Pa., Graduate Student in Bacteriology, Lehigh Univ.

Joseph Lebowich, M.D., 211 Church St., Saratoga Springs, N. Y., Director, Saratoga County Laboratory

Joseph M. Lubitz, M.D., U. S. Marine Hospital, 4141 Clarendon, Chicago, Ill., Chief, Clinical Laboratory

Patterson M. Menlowe, M.D., 1231 Evans Ave., McKeesport, Pa., Director of Laboratory, McKeesport Hospital

Antonio Ortiz de Landazuri, M.D., Biological Laboratory, Dept. of Health, San Juan, Puerto Rico, Assistant Associate Director

Norberto A. Quinones, M.D., 32½ Rosario St., Santurce, Puerto Rico, Assistant Director, Biological Laboratory, Dept. of Health

Vital Statistics Section

Raymond P. Hickey, Jr., B.S., Municipal Bldg., 550 Main St., Hartford, Conn., Director, Bureau of Vital Statistics, Board of Health

Olive M. Lombard, B.S., 47 Charlotte Road, Newton Centre, Mass., Statistical Computer, Dept. of Vital Statistics, Harvard School of Public Health

Clayton F. Mayo, M.S.P.H., 2235 Emerson Ave., Louisville, Ky., Chief Statistician, State Dept. of Health

Robert B. Stark, 1936 Jefferson Ave., New Orleans, La., State Registrar, State Dept. of Health

Beatrice Wiener, B.A., 5709 14th St., N.W., Washington, D. C., Statistical Assistant, National Institute of Health

Engineering Section

Frederick F. Aldridge, M.S., 4055 Grant St., N.E., Washington, D. C., Assistant Public Health Engineer, U. S. Public Health Service

Maxwelton S. Campbell, M.S., 1412 Smith Tower, Seattle, Wash., Chief, Div. of Public Health Engineering, State Dept. of Health

Jose E. Culpeper, B.S., Canals 31, Santurce, Puerto Rico, Assistant Sanitary Engineer, Bureau of Sanitary Engineering, Dept. of Health

Gonzalo Diago, Jr., C.E., "B" 21, Santurce, Puerto Rico, Engineer in Charge of Waterworks and Sewers, Dept. of Health

Juan G. Figueroa, C.E., Taft 3, Santurce, Puerto Rico, Chief, Bureau of Sanitary Engineering, Dept. of Health

F. Vale Kroeber, B.S., 195 N. Columbus Ave., Mount Vernon, N. Y., Swimming Pool Operator, Bronxville Field Club

Robert E. Leaver, B.S., 526 Hutton Bldg., Spokane, Wash., District Public Health Engineer, State Dept. of Public Health

Norberto Montilla-Coll, B.S., Hostos Ave. 77, Ponce, Puerto Rico, District Engineer, Insular Dept. of Health

Garrett Sloan, M.S., Rapides Parish Health Unit, Alexandria, La., Central Regional Engineer, U. S. Public Health Service

Industrial Hygiene Section

Walter E. Doyle, M.D., Div. of Industrial Hygiene, National Institute of Health, Bethesda, Md., A. A. Surgeon

Dr. Victor C. Myers, Bureau of Industrial Hygiene, State Dept. of Health, Lansing, Mich., Assistant Surgeon (R), U. S. Public Health Service

August T. Rossano, Jr., M.S., U. S. Public Health Service, Bethesda, Md., Sanitary Engineer (R), Div. of Industrial Hygiene

George E. Tubich, B.S., Bureau of Industrial Hygiene, State Dept. of Health, Lansing, Mich., Assistant Sanitary Engineer (R), U. S. Public Health Service

Tom F. Vestal, M.D., State Board of Health, Raleigh, N. C., Director, Div. of Industrial Hygiene

Food and Nutrition Section

Ernestine Becker, M.A., 615 N. Wolfe St., Baltimore, Md., Associate in Biochemistry, Johns Hopkins School of Hygiene and Public Health

Harold Blumberg, Sc.D., 615 N. Wolfe St., Baltimore, Md., Research Biochemist, Dept. of Biochemistry, Johns Hopkins Univ., School of Hygiene and Public Health

Claire Foster, B.S., Children's Hospital, 18th & Bainbridge Sts., Philadelphia, Pa., Research Nutritionist

Jesse Walter Hofer, M.D., 338 Franklin Ave., River Forest, Ill., Research Bacteriologist and Chemist, Bowman Dairy Company

Sally Ann Kurka, B.S., 3216 Cliff Ave., Richmond, Va., Nutrition Consultant, State Dept. of Health

Ramon Nieves-Alicea, Santo Cristo St. 9, Box 1410, San Juan, Puerto Rico, General Inspector of Dairies, Dept. of Health

Rosa M. Torres de Rodríguez, M.S., Ave. Saldana 2, Rio Piedras, Puerto Rico, Nutritionist, School of Tropical Medicine

Maternal and Child Health Section

Tomas Ferrer-Delgad, M.D., Santiago Veve, Mayaguez, Puerto Rico, In Charge of Infant Hygiene and Prenatal Clinic

Gregorio Igartua, M.D., Progreso St., Aguadilla, Puerto Rico, Physician-in-charge, Venereal Clinic, Div. of Venereal Diseases

Ramon Fernandez-Marchante, M.D., P. O. Box 3927, Santurce, Puerto Rico, Consultant in Pediatrics, Bureau of Maternal and Infant Hygiene, Dept. of Health

Francisco A. Marques, M.D., P. O. Box 1397, Aguadilla, Puerto Rico, Physician-in-charge, Infant and Prenatal Hygiene Clinics, Dept. of Health

Aida M. Pietri, R.N., 6 America Capo St., Ponce, Puerto Rico, Maternal and Child Health Consultant, Junior Grade, Dept. of Health

Henry C. Sandler, D.M.D., 2360 Eutaw Place, Baltimore, Md., Supervising Dentist, New York City Dept. of Health

Blanca H. Trelles de Vazquez, M.D., 46 Fernandez Juncos Ave., Santurce, Puerto Rico, Physician-in-charge, Div. for Crippled Children

Rafael A. Vilar-Isern, M.D., 4 Vasallo, Santurce, Puerto Rico, Consultant in Obstetrics, Insular Dept. of Health

Nestor I. Vincenty, M.D., Munoz Rivera 10, Rio Piedras, Puerto Rico, Physician-in-charge, Prenatal and Infant Hygiene Clinic, Dept. of Health

Public Health Education Section

Jose R. Alum, M.D., Olimpo Ave., 3, San Juan, Puerto Rico, Director, Rural Medical Dispensaries, Dept. of Health

Diana S. Alter, 314 South Dallas Ave., Pittsburgh, Pa., Volunteer Worker, Board of Directors, Pittsburgh Chapter, American Red Cross

Meta DeLoache, A.B., 47 Ward St., Paterson, N. J., Child Health Worker, Passaic County Tuberculosis and Health Assn.

Marita J. Dick, B.S., C.P.H., 4938 Drexal Blvd., Chicago, Ill., Assistant to Director of Health Education, Tuberculosis Institute of Chicago and Cook County

Emily Ann Fowler, 112 N. Indiana Ave.,

Atlantic City, N. J., Director, Social Service Dept., Atlantic County Public Health Service

Ruby R. Freer, R.N., B.S., 40 Park Ave., Baldwin, N. Y., Public Health Nurse, State Dept. of Health

Edward K. Funkhouser, Mill and Passaic Sts., Paterson, N. J., Executive Secretary, Passaic County Tuberculosis and Health Assn.

Helen Morgan Hall, B.A., 1790 Broadway, New York, N. Y., Food Editor, Public Health Committee of the Cup and Container Institute

Alice H. Hammar, 55 Birchwood Road, East Hartford, Conn., Supervisor, W.P.A. Visual Aids in Health, Hartford Board of Health

Mildred L. Jennings, A.B., 1043 St. Charles Ave., N.E., Atlanta, Ga., Supervisor, State Crippled Childrens Service

Beatriz Lassalle, Wilson Ave., Santurce, Puerto Rico, Chief, Social Welfare Bureau, Insular Dept. of Health

Margaret A. Lewis, B.S., The Sheraton, 37th & Lexington Ave., New York, N. Y., General Field Representative for Metropolitan

New York, National American Red Cross

Rafael M. Mendez, B.S., Belaval St., 10, Santurce, Puerto Rico, Chief, Div. of Property and Accounts, Dept. of Health

Carmen L. Rivera, R.N., Box 664, Mayaguez, Puerto Rico, Head Nurse of Demonstration Area, Public Health Unit, Dept. of Health

Frederick H. Wilke, M.D., 4 East 97th St., New York, N. Y., Physician, Sheltering Arms

Public Health Nursing Section

Consuelo Almodovar-Ortiz, R.N., Urbanizacion Poradis, Caguas, Puerto Rico, Supervisor of Public Health Nurses, Dept. of Public Health

Gregoria Auffant, R.N., 59 Robles St., Rio Piedras, Puerto Rico, Public Health Nurse, Insular Dept. of Health

Kittie Baird, R.N., Versailles, Ky., Public Health Nurse, Woodford County Red Cross

Lynda M. Billet, Mankato, Minn., School Nurse, Board of Education

Lillian M. Bischoff, R.N., B.S., 4606 N. 16th St., Arlington, Va., Assistant Director, Public Health Nursing, District of Columbia Health Dept.

Adelina Burgos, Calle 2-9 Altos, 130 Ohero, Santurce, Puerto Rico, Public Health Nurse Trainee, Insular Dept. of Health

Elizabeth B. Carmody, R.N., A.B., P. O. Box 1171, Deland, Fla., Senior Nurse, Lake County Health Dept.

Carmen M. Carpena-Collazo, Bouret Apts. 33 Marina, San Juan, Puerto Rico, Public

Health Nurse, Insular Dept. of Health

Lottie Chaikin, R.N., C.P.H., Baltimore County Health Dept., Towson, Md., Public Health Nurse, U. S. Public Health Service

Rosa H. Colon, Pargue St., Barranquitas, Puerto Rico, Instructress and District Supervisor, Dept. of Health

Maria L. Cotte, R.N., C.P.H., Lajas, Puerto Rico, District Supervisor, Dept. of Health

Rafaela S. de Rosado, R.N., Del Carmen St., esq. Condado Stop 17, San Juan, Puerto Rico, Public Health Nurse, Dept. of Health

Jacinta R. deVelez-Lopez, R.N., 2 Delicias St., Santurce, Puerto Rico, Area Supervisor, Health Project, WPA

Ruth M. Elliott, P. O. Box 271, Jasper, Fla., Public Health Nurse, Hamilton County Health Unit

Catherine P. Elmer, Gulf County Health Unit, Port St. Joe, Fla., Staff Nurse, County Health Dept.

Lee M. Fuhr, Layfayette 13, c/o Shephards, Santurce, Puerto Rico, Supervisor for Puerto Rico and Virgin Islands, Health Service Project, WPA

Ethel L. Goodwin, R.N., 99 Lakeview Ave., Rockville Center, N. Y., Consultant on Cancer, Div. of Public Health Nursing, Nassau County Dept. of Health

Carmen Grafal de Rivera, Castelar 13, Santurce, Puerto Rico, Supervisor, Public Health Nursing, Dept. of Health

Celia Guzman, R.N., M.A., Duffant 22, Santurce, Puerto Rico, Consultant Nurse in Maternal and Child Health, Dept. of Health

Marguerite B. Harris, R.N., 337 Main St., Paterson, N. J., Public Health Nurse, Board of Health

Isabel de Jesus-Abrams, Domenech, Isabela, Puerto Rico, Public Health Nurse Trainee, Insular Dept. of Health

Mary K. Kennedy, B.S., 1 Riverside Drive, Saranac Lake, N. Y., District State Supervising Nurse, State Dept. of Health

Margarita Mattei-Castillo, Box 45, Yauco, Puerto Rico, Public Health Nurse, Insular Dept. of Health

Ruth G. McDonald, R.N., 305 Greenwood St., Topeka, Kan., Consultant Nurse, Div. of Child Hygiene, State Board of Health

C. Lucille Martin, R.N., 119 South 12th St., Richmond, Indiana, Director, Public Health Nursing Assn.

Victoria C. Mayer, B.S., State Dept. of Health, Santa Fe, N. M., State Nursing Consultant

Adelaida Malave de Sanovitis, Munoz Rivera, Ciales, Puerto Rico, Head Nurse, Dept. of Health

NEWS FROM THE FIELD

PUERTO RICO PUBLIC HEALTH ASSOCIATION ORGANIZED

AN association of public health workers and others interested in public health was organized in San Juan September 23 at a meeting attended by about 200 persons representative of all specialties to be found in the Island. There were 116 active Charter members, all of them identified with the American Public Health Association, with which it is expected that the Puerto Rico Public Health Association will become affiliated.

Officers elected include:

President, E. Garrido Morales, M.D., Dr.P.H.*
President-elect, Pablo Morales Otero, M.D.†
Vice-President, Jose Chavez, M.D.†
Treasurer, Kathleen M. Logan, R.N.*
Secretary, Guillermo Arbona, M.D., M.P.H.†
Representative to A.P.H.A. Governing Council, Oscar Costa Mandry, M.D.*

In addition to the officers, the new Board of Directors includes:

Thomas H. D. Griffiths, M.D.†
 Ezequiel Martinez Rivera, M.D.†
 Ernesto Quintaro, M.D.
 Mary Rahn
 Johanna J. Schwarte, R.N.

More than 100 persons in Puerto Rico applied for membership in the A.P.H.A. through the new organization, a record number, it is believed, for a new local association. Dr. James A. Doull of Western Reserve University, Cleveland, O., was Chairman of the provisional organization committee. Other A.P.H.A. Fellows and members from the continental United States who participated in the meetings include Myron D. Wegman, M.D., Charles T. Wright, James Watt, M.D., Dr.P.H. Richard

H. Fletcher, M.D., M.P.H., John M. Henderson, C.E., Thomas H. D. Griffiths, M.D., Kathleen M. Logan, R.N., Joseph Dean, M.D., and Reginald M. Atwater, M.D., Dr.P.H.

The meetings were held in the School of Tropical Medicine, San Juan, of which Dr. Pablo Morales Otero is the Acting Director.

KANSAS STATE HEALTH ASSOCIATIONS

THE joint annual meeting of the Kansas Tuberculosis and Health Association and the Kansas Public Health Association was held in Emporia, Kans., September 17-18.

All officers of the Kansas Tuberculosis and Health Association were re-elected including:

President—C. E. Coburn, M.D., Kansas City
Executive Secretary—Charles H. Lerrigo, M.D.
Vice-Presidents—F. A. Trump, M.D., Ottawa;
 Luella Taylor, Independence
Treasurer—T. C. Mueller, Topeka

The Kansas Public Health Association elected the following officers:

President—F. E. McCord, M.D., Shawnee County Health Officer
Vice-President—H. H. Asher, M.D., Sedgwick County Health Officer
Secretary—Richard F. Boyd, M.D., Director of Local Health Services for the Kansas State Board of Health
Treasurer—F. C. Beelman, M.D., Acting Secretary and Executive Officer of the Kansas State Board of Health

The Kansas Public Health Association had its inception April 1, 1940, when a conference of county and city health officers was held in Salina. Officers were elected; it was decided to hold the meetings semi-annually; and at the meeting held the following October, a constitution and by-laws were adopted, and officers elected at the previous con-

* Fellow A.P.H.A.

† Member A.P.H.A.

ference were inducted as officers of the newly organized Kansas Public Health Association. The meeting held recently in Emporia was the fourth session.

NEW HEALTH COURSES AT MASSACHUSETTS STATE COLLEGE

IN cooperation with the Massachusetts Department of Public Health, Massachusetts State College at Amherst will offer for the first time this academic year a series of courses in public health subjects for undergraduate and graduate students. Dr. Leon A. Bradley, Head of the Department of Bacteriology, will direct the special courses of study.

The undergraduate work will be given in a 4 year course leading to the Bachelor of Science degree, with general scientific and cultural courses concentrated in the first two years and specialized courses in the last two academic years. The advanced studies will include lectures, recitations and laboratory work in the several branches of local, district, and state public health work. Graduate courses for those with Bachelor of Science degrees from this and other accredited colleges will be given, leading to the issuance of a suitable certificate of proficiency in the chosen field upon the completion of an additional year of academic work. At present, no "short courses" will be offered.

These courses will prepare men and women without medical or nursing training for responsible positions in state, municipal, and county health departments in capacities such as administrative worker, sanitary inspector, laboratory technician, and water and sewage plant operator. The academic faculty will be supplemented by the staff of the Massachusetts Department of Public Health and local health departments, working through the departmental sanitary engineering and medical representatives at Westfield, Mass., C. I. Sterling, Jr., and Dr. Charles E. Gill.

UNIVERSITY OF OREGON MEDICAL SCHOOL CREATES FULL-TIME DEPARTMENT IN PREVENTIVE MEDICINE AND PUBLIC HEALTH

DR. RICHARD B. DILLEHUNT, Dean of the University of Oregon Medical School, has announced the creation of a full-time Department of Public Health and Preventive Medicine with Dr. Adolph Weinzirl as Professor and head of the department. Dr. Weinzirl has served during the past 4½ years as Health Officer of Portland, Ore., and previously as director of communicable disease in the Baltimore City Health Department. Dr. Weinzirl is a graduate of the University of Oregon Medical School and has an M.P.H. degree from Johns Hopkins School of Hygiene and Public Health.

CUTTER LECTURE

THE Cutter Lecture on Preventive Medicine was delivered on October 22 at the Harvard Medical School by Sir William Wilson Jameson, Chief Medical Officer, Ministry of Health, London, England. The subject was "Public Health in Britain at War."

These lectures are given annually under the terms of a bequest from John Clarence Cutter, M.D., whose will provided that the lectures so given should be styled the Cutter Lectures on Preventive Medicine and that they should be delivered in Boston and be free to the medical profession and the press.

FEDERAL AID IN TRAINING NURSES

EIGHTY-EIGHT schools of nursing selected by the U. S. Public Health Service to receive federal aid in training additional student nurses have been named by Surgeon General Thomas Parran.

Sixty-seven schools in 32 states will offer refresher courses to 3,000 graduate nurses and 26 schools will enroll 500 graduate nurses for post-graduate study. A total of \$1,200,000 is available for

the program, which includes field training centers for public health nursing.

The student-nurse training program will increase enrollment by 2,000 young women in this country, Hawaii and Puerto Rico. It is estimated that there is a need for 50,000 student nurses this year, and the federal program will bring the total to about 42,000. The average yearly enrollment is slightly under 40,000. It is hoped schools able to increase their enrollment without federal aid will meet the deficiency.

LOYOLA UNIVERSITY

THE Department of Preventive Medicine, Public Health and Bacteriology, Loyola University School of Medicine, Chicago, Ill., has received a grant of \$4,450 for the expansion of its facilities for the field training of students in public health nursing.

HARBEN LECTURES

PROFESSOR E. V. McCOLLUM of the School of Hygiene and Public Health of the Johns Hopkins University, will deliver the Harben Lectures of the Royal Institute of Public Health and Hygiene of London, England, for the year 1941. Owing to war conditions the University of Toronto has been designated for the delivery of the lectures, which will be given on December 1, 2, and 3. The subjects of the lectures are: "Nutritional Science and Public Health"—(1) Inorganic elements which present nutrition problems of practical importance; (2) Problems presented by the availability of low-cost synthetic vitamins—enrichment, fortification and restoration of refined foods; (3) Nutrition problems presented by low-income families.

INDUSTRIAL HYGIENE COURSE

IN order to provide trained industrial hygienists to meet the needs of expanding health and safety services in the defense industries, the University

of Pennsylvania offers a course of instruction, of 12 weeks' duration, in industrial hygiene.

The course will be given under the auspices of the Engineering, Science and Management Defense Training Program of the U. S. Office of Education and is open to graduates in engineering, chemistry, or allied sciences.

The course runs from October 27, 1941, to January 17, 1942. Applications for admission to the course should be addressed to: Theodore Hatch, Associate Professor of Industrial Hygiene, Department of Public Health and Preventive Medicine, University of Pennsylvania, Philadelphia, Pa.

INDUSTRIAL HYGIENE FOUNDATION OF AMERICA

THE Board of Trustees of Air Hygiene Foundation of America, Inc., has announced the change of the organization's name to Industrial Hygiene Foundation of America, Inc. The Foundation was originally set up in Ohio in 1935 but has been reincorporated under the laws of Pennsylvania. The new name more clearly describes the Foundation's activities and services for the protection of employee help.

When the Foundation was organized its first emphasis was placed on silicosis. Current literature on health is digested by the Foundation for the information of its members covering about 300 journals. Industrial hygiene laboratory facilities are also maintained at the Mellon Institute. The Foundation maintains industrial hygienists in the field, making surveys for member companies. Its function is to help keep precautions apace with production for its member companies and their million workmen.

ALABAMA FELLOWSHIP IN PUBLIC HEALTH OBSTETRICS

THE Alabama State Department of Public Health, in coöperation with the Children's Bureau of the U. S.

Department of Labor, announces fellowships in public health obstetrics for physicians who have had a minimum of a year's rotating internship and one year of obstetric training. Training provided will embrace field work in already established maternity clinics in rural areas; in the organization of new centers and rotating through the various departments and projects connected with the obstetric aspects of public health. A stipend of \$150 a month, plus travel while in the field, is provided. Applications should be sent to Dr. J. N. Baker, State Health Officer, Montgomery, Ala.

EIGHTH PAN AMERICAN CHILD CONGRESS

THE Eighth Pan American Child Congress will be held in Washington, D. C., May 2 to 9 under the auspices of the United States Government. Miss Katharine F. Lenroot, Chief of the Children's Bureau, U. S. Department of Labor, is Chairman of the Organizing Committee.

This Congress has been arranged in accordance with the unanimous recommendation of the Governing Board of the Pan American Union, meeting in November, 1940, and with the recommendation of the Council of the International American Institute for the Protection of Childhood. An Act of Congress implementing the Child Health Congress was passed April 1, 1941.

The Eighth Congress will be divided into three sections on Health Protection and Medical Care, on Education and Recreation and on Economic and Social Services for Families and Children. Official delegates will be appointed by the governments represented in the Congress. Individual members will be representatives of government agencies and private associations and other persons engaged in work related to the health, education, or welfare of children.

CUBAN PUBLIC HEALTH ASSOCIATION

THE Cuban Public Health Association, Havana, has announced the election on August 28 of the following officers:

President: Dr. Antonio Diaz Albertini

Technical Director: Dr. Domingo F. Ramos

2nd Tech. Director: Dr. Alberto Recio y Forns

Treasurer: Dr. Hugo Roberts y Fernandez

Technical Secretary: Dr. Horacio Abascal y Vera

Administrative Secretary: Dr. Jose F. Rodriguez-Perez

Representative to the A.P.H.A. Governing Council: Domingo F. Ramos, M.D.

The Cuban Public Health Association (Sociedad Cubana De Salubridad Publica) is an affiliated society of the American Public Health Association.

PERSONALS

Central States

MAUDE CARSON, R.N., has been appointed Chief Supervising Nurse of the Division of Public Health Nursing of the State Health Department of Illinois. This is a new division created recently because of the expanded activities of the Health Department.

MAURICE KAMP, M.D., who is on loan from the U. S. Public Health Service to the Indiana State Board of Health, is now Director of District No. 3, Health Department, Albany, Ind.

CHARLES K. KINCAID, M.D.,† former Director of District No. 3, in southern Indiana, has been appointed Director of the Au Claire City-County Health Department, Au Claire, Wis.

CHARLES H. MANN, M.D., Dr.P.H.,‡ formerly associated as Instructor in Hygiene and Public Health, University of Michigan, Ann Arbor, Mich., has been appointed Director of Local Health Service with the Idaho State Department of Public Health, Boise, Idaho.

* Fellow A.P.H.A.

† Member A.P.H.A.

ARTHUR B. MORRILL, engineer of sewage treatment with the City of Detroit, Mich., has been granted a year's leave of absence to supervise camp sanitation along the Burma Road in China. Mr. Morrill, who will leave this month for China, will be employed by the U. S. Public Health Service and will be Senior Sanitary Engineer with the Burma-Yunnan Railway Medical Commission.

CARL SCHWOB† has resigned as District Engineer of the Illinois State Board of Health, Chicago, Ill., to join the Yeoman Brothers Company, Chicago. Mr. Schwob figured prominently in the cleanup of the typhoid epidemic at the Manteno State Insane Hospital in 1939.

GRACE S. WIGHTMAN, M.D.,† has been appointed Chief of the new Division of Maternal and Child Hygiene of the Illinois State Health Department. This Division was recently formed because of expanded activities of the Health Department.

Eastern States

HENRIETTA LANDAU,† formerly with the Public Health Nursing staff in New York State, has been appointed Public Health Nursing Consultant with the U. S. Public Health Service for District 3 with headquarters in Chicago, the district including Illinois, Indiana, Kentucky, Michigan, Ohio and Wisconsin.

JOSEPH I. LINDE, M.D.,* Health Officer of New Haven, Conn., who was appointed to complete the unexpired term of the late Dr. JAMES STEPHEN MAHER on the State Tuberculosis Commission, has now been appointed to a regular term of six years by Governor Hurley.

WILLIAM J. MCCONNELL, M.D.,* Assistant Medical Director, Metropoli-

tan Life Insurance Company, New York, N. Y., reported for duty as consultant to the Division of Industrial Hygiene, National Institute of Health, Bethesda, Md. He will direct the procedure to be used in the nation-wide survey of present-day medical service facilities in industry.

CHARLES L. POOL, Lt. Commander, Civil Engineer Corps, U. S. Naval Reserve, Chief Engineer, State Department of Health, Providence, R. I., has been called to active duty at the Naval Operating Base, Norfolk, Va.

CHARLES F. WILINSKY, M.D.,* Director of Beth Israel Hospital, Boston, Mass., received the honorary degree of Master of Arts from Harvard University.

Southern States

D. S. ABELL, Principal Assistant Engineer of the North Carolina State Board of Health, has left that position to become Chief Engineer and Director of the Bureau of Sanitation in the Alabama Department of Public Health. Mr. Abell served nine years with the North Carolina Department.

R. L. CHERRY, M.D., M.P.H.,* formerly Director of the Tyler-Smith County Health Unit, Tyler, Tex., has been appointed Field Director of Local Health Services, State Department of Health, Austin.

ALBERT S. J. CLARKE, M.D., of Ozark, Tex., has been transferred to Monticello to be Health Officer of Drew County.

BENJAMIN M. DRAKE, M.D.,† Kenansville, N. C., has resigned as Health Officer of Duplin County, to accept a position in the Moore County Health Department.

JOHN H. FINN, M.D., of Refugio,

* Fellow A.P.H.A.

† Member A.P.H.A.

Tex., was recently appointed Health Officer of Refugio County, succeeding DR. HADDON B. WOODS, who has been called to service in the Army.

LYNWOOD H. GASTON, M.D.,† of the U. S. Public Health Service, has been assigned to work in Oklahoma as part of the coöperative policy in defense areas.

HUGH H. HAWLEY, JR., M.D., Anadarko, Okla., has been appointed Health Officer of the Caddo County Health Department.

LYNWOOD B. JONES, M.D., formerly Health Officer of Monticello, Tex., has been changed to Ozark as Health Officer of Franklin County.

MASON G. LAWSON, M.D.,† of Benton, Tex., has been appointed Health Officer of Miller County, Texarkana.

EDNA LEWIS,† former Associate Professor of Nursing Education at George Peabody College, Nashville, Tenn., has been appointed Director of Public Health Nursing in the Department of Preventive Medicine, Public Health and Bacteriology, Loyola University, Chicago, Ill. Miss Lewis succeeds DR. DOROTHY ROOD.

MILNER C. MADDREY, M.D., Health Officer of Roanoke Rapids, N. C., resigned. He is succeeded by DR. ROBERT M. BARDIN.

SYLVESTER S. MUNGER, M.D., has been named City Health Officer of Marlin, Tex.

WILLIAM HARVEY PERKINS, M.D.,† Professor of Preventive Medicine at Tulane University, New Orleans, La., has been appointed Dean of Jefferson Medical College, Philadelphia, succeeding the late HENRY K. MOHLER, M.D.

HAROLD C. SHILLING, M.D., Fort Worth, Tex., has been made Director of the Hunt County Health Unit.

LOWELL L. STOKES, M.D., Anadarko, Okla., Health Officer of the Caddo County Health Department, has been

placed in charge of a newly created unit in Okmulgee County.

BENNETT A. WIGHT, M.D., Kermit, Tex., has been placed in charge of the Gregg County Health Department.

HENRY C. WILSON, M.D.,† of Greenville, Tex., has been appointed Health Officer to the Tyler-Smith Counties Health Unit.

Western States

JACK C. HALDEMAN, M.D.,† recently Health Officer of Wasco County, Ore., with headquarters in The Dalles, has been appointed to take charge of a new Health Unit in Christian County, Ky.

EDWIN H. JORRIS, M.D.,† recently a Health Officer, with headquarters at Sparta, Wis., has been made Director of the Tuberculosis Division in State Department of Health.

WALTER S. KOTAS, M.D., formerly of Greybull, Wyo., has been appointed Director of the Cheyenne and Laramie County Health Unit.

ERNEST NEWMAN, M.D.,† of Wausau, Wis., has resigned as Director of the Health Unit of Marathon County to join the U. S. Public Health Service.

Hawaii

MARY H. LEMON,* Registrar General of Vital Statistics, Board of Health, Honolulu, is retiring from Public Service in Hawaii.

DEATHS

W. FRANK WALKER, Dr.P.H.,* Director of the Division of Health Studies of the Commonwealth Fund, New York, N. Y., died September 27.

EDGAR WHEDBEE, a sanitary engineer employed in the Waterworks Department of the City of Dallas for the last 15 years, died in Bonham, Tex.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

American Association for the Advancement of Science. New York, N. Y. December 28-January 2.

American Library Association—Midwinter Conference. Chicago, Ill. December 28-31.

American Public Welfare Association—Round Table and Annual Meeting. Washington, D. C. December 12-14.

American Society of Heating and Ventilating Engineers—Seventh International Heating and Ventilating Exposition. Commercial Museum, Philadelphia, Pa. January 26-30, 1942.

American Society for Public Administration. New York, N. Y. December 27-30.

American Statistical Association. New York, N. Y. December 27-31.

American Water Works Association—North Carolina Section—Sheraton Hotel, High Point, N. C. November 3-5.

Four States Section—Lord Baltimore Hotel, Baltimore, Md. November 6-7.

Florida Section—Osceola Hotel, Daytona Beach, Fla. November 13-15.

New York Section—Hotel Commodore, New York, N. Y. December 30.

Child Study Association of America. Hotel Commodore, New York, N. Y. November 14-15.

Colorado Public Health Association. La Junta, Colo. November 7-8.

Florida Public Health Association. Orlando, Fla. December 4-6.

Illinois Public Health Association. Springfield, Ill. December 4-5.

Michigan Public Health Association. Grand Rapids, Mich. November 12-14.

National Municipal League—47th Annual Conference. St. Louis, Mo. November 17, 18, and 19.

National Society for the Prevention of Blindness. New York, N. Y. December 4-6.

New Jersey Health and Sanitary Association, Inc.—All-day conference at the Stacy-Trent Hotel, Trenton, N. J., December 5.

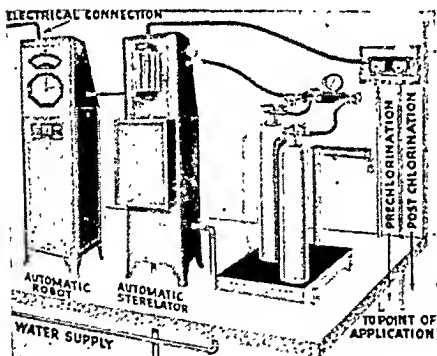
Texas Public Health Association. Corpus Christi, Tex. November 3-5.

West Virginia Public Health Association. Charleston, W. Va. November 17-19.

Foreign

Pan American Medical Association—8th Congress. Buenos Aires, Argentina. 1941.

Pan American Conference of Directors of Public Health—4th. Rio de Janeiro, Brazil, 1942.



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American Journal of Public Health and THE NATION'S HEALTH

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For Whom the Bell Tolls*

ABEL WOLMAN, DR.ENG., F.A.P.H.A.

*Professor of Sanitary Engineering, The Johns Hopkins University,
Baltimore, Md.*

"NO man is an *Iland*, intire of it selfe; every man is a peece of the *Continent*, a part of the *maine*: if a *Clod* bee washed away by the *Sca*, *Europe* is the lesse, as well as if a *Promontorie* were, as well as if a *Mannor* of thy *friends* or of *thine owne* were; any mans *death* diminishes *me*, because I am involved in *Mankinde*; And therefore never send to know for whom the *bell* tolls; It tolls for *thee*."—JOHN DONNE.

Almost three centuries before the founding of the New Jersey Health and Sanitary Association, the poet John Donne emphasized in the above words the central theme of my remarks for this evening. They are peculiarly appropriate because the first official meeting of the New Jersey Health and Sanitary Association on October 13, 1875, resulted in a permanent organization which was to devote almost three-quarters of a century to activities dominated "by the vision of lifting the load of preventable sickness and death from mankind."

This organization recognized and accepted man's responsibility to man and to society for the saving of life. It accepted the thesis: "any mans death diminishes me, because I am involved in Mankinde."

Already in 1875 it sensed the responsibility in a democratic society of all citizens to the community. It added to the Bill of Rights a parallel Bill of Duties. Although every citizen, it was agreed, is guaranteed the essentials of a decent life, the association recognized the parallel axiom that every citizen owed a responsibility to the community.

These parallel duties and responsibilities have been ignored perhaps for a time in this country. They have been revived in the last several years by a renewed emphasis on the strength as well as on the failures of democracy. Once more the truth is being driven home that "no man is an *Iland*, intire of it selfe."

It is fruitful, therefore, before this group, to take stock of how well responsibility has coped with public health problems and practices; to describe how these practices have changed and expanded in recent years; to point

* Presented to the New Jersey Health and Sanitary Association, Atlantic City, N. J., October 13, 1941.

out how such changes have brought changes in requirements for professional service and in the structure of administrative practice; and to comment on what the implications of these issues are during the war and post-war periods.

CHANGING CONCEPTS

Within the past five years a revolution in public health practice has occurred in the United States which in some ways has paralleled that of over a hundred years ago in England. The late Edgar Sydenstricker, perhaps more than any other single individual, gave impetus to an expanded sphere of public health practice which was incorporated in the Social Security Act of 1935. For the first time a mechanism was established which at one stroke made it possible to expand the field of public health activity to catch up and keep pace with the enriched social service development of that same period.

By that one Act the following non-debatable assumptions were written into the law:

1. The health of the people is a matter of public concern.
2. Ill health is a major cause of suffering, economic loss, and dependency.
3. Good health is essential to the security and progress of the nation.

The frank acceptance of these axioms marked a delayed but rapid transition from the simpler standards of public health practice to the wider, more complex and more deep-seated issues of future public health practice.

Through the apparently minor addition of Titles V and VI to the Social Security Act, almost a complete change has taken place in American public health practice. Incidentally an annual total of new money for health work from official sources results, with well over a hundred million dollars of expenditure since 1935.

In the words of Surgeon General Parran: "Public Health has become a people's cause." He compares this revolution with the Renaissance and the French Revolution in the fields of art and literature, and politics, respectively.

It may well be asked why this revival occurs at this time and what aspects thereof are likely to dominate the future scene. The last 10 years have witnessed some of the most striking social and political upheavals the world has seen. In all of them one may detect the hope for a newer and better world and a desire to be born well and to live well.

The American people have been shocked, in addition, into the realization of the problems of health by the recent examinations of its most favorable male age groups, under the terms of the Selective Service Act. The percentage of rejections of the young men of our country at ages 21 to 35, as physically unfit to enter training for military service or fit for limited service only, provides an important index of our general national health.

It is startling to be reminded once more that this excessive rejection rate should occur in perhaps the richest country in the world with respect to resources, man power, and scientific capacity.

The significant aspect of this recognition, however, lies in the militant desire of the public to develop plans and programs for correctives. Virtually all lay and professional groups insist upon a prompt attack on the state of affairs which the record discloses. No longer are people willing to wait for the leisurely recognition and elimination of tuberculosis, the venereal diseases, rheumatic fever, defects of the teeth and of the eye and of the sequels of recognized and unrecognized nutritional deficiencies.

Besides these more obvious demands, the most difficult problems of the future will require a search for reliable

measures of physiological fitness so as to detect the onset of many of the diseases which will appear with increasing frequency as the average age moves higher and higher in this country.

We must examine the result of the severe demand on the nervous system of our people, due not only to shifts in the occupation of our citizens, but in the consequent change in the whole mode of life which such shifts in occupation and the growth of urbanism have brought about.

Dr. Walter B. Cannon points out a new world of medical investigation, where "the abilities of the same individual would be followed in childhood and adolescence, in adulthood and old age, as affected by the demands of school or the exacting periods of puberty and the climacteric, by prolonged labor, fatigue, high altitude, different sorts of training, insomnia, worry and dissipation. Information thus obtained would furnish a measure of physiological age, a measure much more important for many judgments than chronological age."

PERSONNEL STANDARDS

With such broadened areas of professional responsibility have come naturally increased demands upon professional workers. It should be obvious that neither the novice, the ill-trained, nor the untrained can properly encompass the scope or develop the programs so essential for this new kind of public health practice. Even with the necessary professional equipment, one could not do real justice either to the responsibility or to the public if the initiation and administration of such programs are relegated to intermittent supervision and attention.

It is for these reasons that many groups, notably the American Public Health Association and the American Medical Association, have struggled for

years to build up further criteria for professional training and attainment. Devices and approaches are at hand for evaluation of professional accomplishment.

Elaborate extensions of the possibilities of control have been and are being met in many of the counties of the United States. Strong efforts are likewise being made to introduce into the schools of the nation a proper understanding, on the part of teachers, of modern public health standards and practices, which might be instilled into the minds of that most hopeful sector of our population, the young.

These same desires for raising the general level of public health performance have pushed forward the introduction of merit systems so that professionally equipped individuals may be assured a minimum of interference by political forces and a maximum opportunity for public service. These systems, of course, must be so designed and so operated that they do not become a mere cloak for the protection of mediocrity rather than an administrative device for the protection of competency and the true enrichment of public offices.

THE ETERNAL LAG IN SOCIAL ORGANIZATION

Perhaps in this brief summary of what has been going on in the last five or six years some oversimplification has occurred which may indicate either that the program was easy or that the obstacles are all cleared. This is far from the truth. None of these profound changes have taken place without contest and virtually all of them are perhaps a century in arrears. The recognition of the social responsibility for public health practice appears in the literature and in disconnected, although important, efforts prior to 1935. There has, however, been a lag in time between the recognition of the need and

the implementation of administrative structure to meet that need.

Volumes have been written, of course, for many years about the fact that sickness and death recognize neither rank nor class, but it is still not too generally accepted that the use of sulfonamide drugs should not be determined by the income but by the disease of the patient.

In all of these discussions, of course, the hoary arguments of over a hundred years ago take on new life in opposition to any advance in public health practice. It is still charged that there is something debilitating to the individual in the effort to help him to live and let live. Even at this late date some people feel that it destroys character to prevent an individual from getting tuberculosis.

When the pseudo-desires to preserve character fail, only to kill the individual, then prompt recourse is still frequently had to the legal abstractions of preserving freedom against the vicissitudes of social organization. The late Justice Brandeis referred to this eternal struggle as "the abstract dialectics between 'liberty' and the 'police power,'" while his earlier associate on the Supreme Court bench, Justice Cardoza, described the battle in the following terms:

"Judges march at times to pitiless conclusions under the prod of a remorseless logic which is supposed to leave them no alternative. They deplore the sacrificial rite. They perform it, none the less, with averted gaze, convinced as they plunge the knife that they obey the bidding of their office. The victim is offered up to the gods of jurisprudence on the altar of regularity."

Sir John Simon well characterized this behavior in England about a century ago:

"When your orders are addressed to some owner of objectionable property—of some property which is a constant

source of nuisance, or disease, or death; when you would force one person to refrain from tainting the general atmosphere with results of an offensive occupation; when you would oblige another to see that his tenantry are better housed than cattle, and that, while he takes rent from lodging, he shall not give fever as an equivalent—amid these proceedings you will be reminded of the 'rights of property' and of 'an Englishman's inviolable claim to do as he will with his own.'"

These issues of regulation versus liberty are important today more than at any other time in our history, but the resolution of this contest will be intelligently accomplished by insistence upon a well grounded principle recognized by the readers in law that "law must be stable and yet it cannot stand still" (Dean Pound).

Many years ago, for example, Justice Brandeis, in the case of *Curt Muller versus the State of Oregon*, pointed out "as healthy mothers are essential to vigorous offspring, the physical well-being of woman becomes an object of public interest and care in order to preserve the strength and vigor of the race." This profound principle now has far greater acceptance than it had 20 years ago. We may see before long its further extension into the field of housing, where Mayor LaGuardia over 20 years ago stated that "once landlords were not compelled to heat their tenements. In years to come it will be the law to refrigerate them in summer, on the ground that life depends upon it—life for the 99 per cent who cannot go to Newport."

All of this simply means that man's desire for safeguarding birth, for protecting life, and for deferring death will continue to lead to new demands. The public health profession will be eternally confronted with the necessity of adapting the fruits of science to the accomplishment of these ends. In a war

period, such as now, these demands are more dramatic than normally. It becomes practically important to prevent disease during war. It becomes a matter of "total war" efficiency to insist upon positive health. Three-thirds of a nation *must* be well fed and well protected, if for no other reason than to resist an enemy. The results of successful public health control are tangible, obvious, and compelling.

The drama of war makes a gun or an airplane an important unit in a vital statistics table, because a rejected gunner or airplane pilot is not only an indication of a public health failure, but of a potential collapse in total defense. Men, therefore, *must* be kept well, rather than *should* be kept well, as is the phrase in peace time.

One may well ask why this emphasis might not properly be transferred to post-war acceptance rather than once more relegated to the files of history.

In these new efforts the New Jersey

Association has a major part to play. It must resume and reactivate the eternal struggle to inform the lay public as to the possibilities of improving the public health. Now as never before it must be emphasized to you that "a successful code of hygienic life cannot be created out of a vacuum and applied like a poultice to the men and women in the United States." To lead them requires professional equipment, courage and energy.

That the task is still worth the effort is made clear by the still too startling fact that today, even as we met, the bell tolled in New Jersey over 125 times. During dinner alone, each one of us might have heard the doleful dirge reminding us over 20 times that preventable death challenges the vision and the spirit of your group. I have no doubt that your attentive ears have heard and that your courageous minds will accept this challenge, as you did in 1875.

Four Years of Contraception as a Public Health Service in North Carolina

GEORGE M. COOPER, M.D., FRANCES ROBERTA PRATT,
R.N., AND MARGARET JARMAN HAGOOD, PH.D.

*North Carolina State Board of Health, Raleigh, N. C., and the Institute for
Research in Social Science, University of North Carolina, Chapel Hill, N. C.*

SINCE the spring of 1937 when the North Carolina State Board of Health officially accepted contraception as one of the maternal health services to be offered to the needy mothers of the state through local health centers, widespread interest has been evinced in the program. That such a radical innovation should have been pioneered in a southern state is in itself a remarkable occurrence. Articles in both professional and popular periodicals have supplied the reading public with information on some of the details of the program. However, one aspect of the significance of this four year old program has received scant attention. Commendable as it may be that 70 per cent of the underprivileged mothers of the state may now receive instruction and supplies to aid them in spacing their children, of greater import for social and medical planning in all areas is a demonstration of the technics by which such an innovation in population policy has been translated from theory into practice. For the technics have been so normal and so successful that in the four years of operation of the North Carolina program of contraception as a public health service, practically no opposition has been manifested.*

At the beginning of the program in 1937 the State Board of Health sent a letter to each county health officer stating that he might, if he considered it desirable after securing the approval of the county medical society or the county board of health, add instruction in contraception to the other medical services provided for the underprivileged. The assistance in such a program of a special field consultant, Miss Frances Roberta Pratt, together with the contraceptive supplies needed for the first months of the work was offered and financed through a special contribution to the State Board of Health.

Four years having elapsed since the beginning of the project, it was felt that a review would be of value, both in estimating the results secured and in guiding the plans for its future. Moreover, since North Carolina had been the first to undertake such a state-wide program, it seemed that the review would be of interest to other states which had begun such work more recently or were considering it. Early in 1941, therefore, statistics were assembled from the offi-

* The North Carolina State Board of Health has received only one letter voicing criticism of the program.

cial annual reports of all of the health centers to the State Board of Health. In addition, one of the writers (F. R. P.) under the joint direction of the State Board of Health and the Institute for Research in Social Science of the University of North Carolina, visited 37 of the larger and more accessible of the contraceptive centers. These served 47 counties and 4 city units and had cared for 90 per cent of all the contraceptive patients. The results are given as of January 1, 1941.

THE NUMBER OF CONTRACEPTIVE CENTERS AND PATIENTS

The rapid increase during the four years in the number of the centers where information on methods of pregnancy spacing can be secured is shown in Table 1, compiled from the official

instructions were issued to the health centers that the numbers of contraceptive patients should be included in the Maternity Health section of the standard reporting forms for the county health units. As the service was new, however, and as, until December, 1940, there was no printed item for this service in the reporting forms, the reported numbers are undoubtedly smaller than the numbers of patients actually given the service. This reason for under-reporting should be kept in mind in interpreting the data in Table 1.

The numbers of patients admitted in each year for contraceptive instruction or supplies are recorded in column 5 of the Table. As it is the custom to close all cases at the end of each year, readmitting the cases at the first visit in the next year, the reported figures do

TABLE 1

Counties Having Public Health Centers and Contraceptive Services; Numbers of Contraceptive Patients, 1937-1940

Year	Counties Having Health Services *			Contraceptive Patients	
	Total	With Contraceptive Services		Number	Number per 1,000 Women of Child-bearing Age (20-44)
		Number	Per cent of Total		
1937	64	6	9	236	4.1
1938	78	38	51	867	4.2
1939	75	53	71	1,599	4.8
1940	81	61 †	75	3,233	9.2
Year unspecified				285	
Total				6,220	

* There are 100 counties in North Carolina.

† Served by 47 centers including 5 connected with city units.

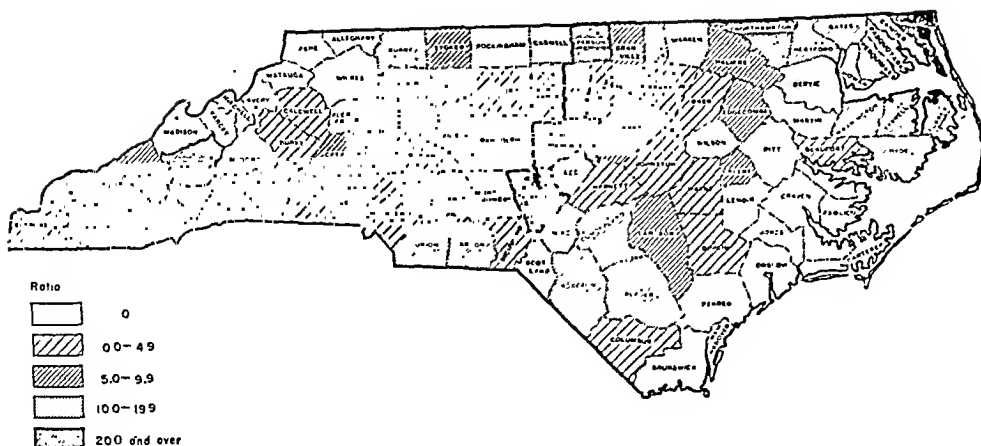
reports. Of North Carolina's 100 counties, 81 have public health units either within the county or in collaboration with one or more other counties. Of these health-center-equipped counties 61, or 75 per cent, have added contraceptive instruction to their medical services. The inhabitants of these counties, presumably having access to such instruction, comprise 70 per cent of the population of the state.

Early in the course of the program,

not allow one to ascertain the total number of different families which have been given service since the beginning of the program. However, as the renewal of supplies is commonly needed at least once a year, the total for the four years, 6,220, indicates with reasonable accuracy the number of patient-years of service, a quantity often unavailable with other forms of recording.

The rapid increase in the number of contraceptive patients is due in part to

NORTH CAROLINA



Map 1. RATIO OF CONTRACEPTIVE PATIENTS TO 1,000 MARRIED WOMEN OF CHILDBEARING AGE, NORTH CAROLINA, 1940.

the increase in the territory covered in the successive years. To obtain a measure of the relative degree of coverage of the population the number of patients was related to the number of married women of childbearing age (20-44) in the areas included in the program. The "coverage ratios" per 1,000 such women are shown in column 6 for the four years. This ratio has increased until, in 1940, about one married woman of childbearing age out of 100 in the areas covered was receiving contraceptive service through these public health centers. The 1940 ratios in the various counties, one as high as 39 per 1,000, are shown in Map 1. As the program is a new one, and consequently not known to all who might wish to avail themselves of it, it seems probable that the increase in coverage noted in 1940 will continue as the program is carried on in future years.

It would be preferable to use as a base for the coverage ratios not the total number of married women of childbearing age, but the number who because of lack of financial resources are considered "eligible" for service in the centers reviewed. The fact that in 1940 nursing service was given to 25

mothers per 100 live births in the area studied suggests that the "eligible" population is approximately one-fourth of the total, and, consequently, that about 3.7 per cent of this "eligible" population received contraceptive service from the centers.

The counties with the highest ratios on the whole are those where the program has been in operation the longest. It is reasonable to expect that within a few years the coverage ratios will increase to an extent where there will be an appreciable effect on the birth rate, and on the infant and maternal mortality rates, although analysis to date has shown no such effect.*

From the annual reports of the centers it was found that in 1940 an average of 2 visits either in the clinic or in the home were recorded for each contraceptive patient. This may be interpreted as indicating roughly about one follow-up visit per year to new patients admitted during the year, and about

* An analysis including correlation of coverage ratios of 1938 and 1939 with the changes between the birth rates and mortality rates of the year in question and the following year, showed no discernible effects. See Jerry Daniel, *Differential Fertility in North Carolina*, unpublished master's thesis, University of North Carolina, Chapel Hill, 1941.

two visits to old patients carried over from the preceding year.

SOURCE OF REFERRAL OF PATIENTS

The staff of each of the 37 centers visited was asked for an estimate of the proportion of cases coming to them from each type of referral source. These estimates were then combined with the patient-years reported by the clinic in question. This calculation indicated that for the entire area public health nurses were responsible for 67 per cent, private physicians for 15 per cent, and social workers for 12 per cent of the referrals. Probably the most frequent type of contact is that where the mother has received postpartum service, since 92 per cent of the centers report that postpartum patients are informed of the service where contraception is especially indicated. That information regarding the service is not universally distributed to postpartum patients or that these, because of the effort involved or for other reasons, do not accept it in a large proportion of the cases is indicated by the fact that in 1940 the contraceptive patients from all sources amounted to only 27 per cent of those receiving postpartum nursing care.

CONTRACEPTIVE METHODS USED

Certain general policies of administration of the local contraceptive programs have been set up in broad terms by the North Carolina State Board of Health. These permit great flexibility in the adjustment of procedures to each local situation. The choice of method, for example, has been left to the health officer in each instance. In 30 of the centers foam powder and sponge was reported to be the method most frequently employed. This was especially the case where rural surroundings and the resulting distances made the patient's home the most frequent place of instruction. The remaining 7 of the

centers reviewed gave diaphragm and jelly as the most frequent prescription. Twenty-three of the centers reported that they use only one type of contraceptive.

Estimates by the staff of each of the 37 centers visited of the proportions given each method were applied to the patient-years reported. The totals indicate that in 5,596 patient-years of service, foam powder and sponge were used for 72 per cent, diaphragm and jelly for 27 per cent, and condom for 0.5 per cent. Several centers reported that a change from foam powder and sponge to diaphragm and jelly was contemplated.

METHOD OF EXTENDING SERVICE

Flexibility of procedure to adapt to local conditions is also shown by variations in the method of giving the service. Four different methods are used with appreciable frequencies, although health department clinics and home visits are by far the two most important methods. Based on the estimates of the staffs of the 37 clinics and the cases reported by each, it was found that 57 per cent were instructed in the health department clinics, 35 per cent in home visits by public health nurses under the health officer's direction, 3 per cent by private physicians, and 1.6 per cent in hospital clinics. The pattern of providing clinics for the women who can get to them in cities and towns, and of nurses making home visits to those in more distant rural areas seems to prevail and appears to be a rational policy.

The acceptability and effectiveness of the different types of contraceptives employed can be determined only by analysis of the individual records. A preliminary analysis of the records of two selected centers by Richardson and Klaiss suggests satisfactory results from the foam powder and sponge technic. All but 3 of the centers are now using

for each patient the standard contraceptive record form recommended by the State Board of Health. Although few clinics to date have filled out these forms in full, 14 of the most important centers have agreed to record for subsequent patients all data required for research purposes.

DISCUSSION

The data on volume and distribution by centers of contraceptive patients indicate that the North Carolina program of contraception has passed the critical initial period and is now firmly established as an integral part of the maternal health services offered by local centers. The trend of increasing coverage ratios suggests that within a few years the program will exercise an appreciable influence in the direction generally advocated in recommendations for American population policy.

The local variations in the program indicate the local autonomy exercised in setting up the service. The lack of an arbitrary pattern superimposed from above is further indicated by reported and projected changes in procedure, which also give hope of ready adaptation to future discoveries with bearing on acceptability and effectiveness in the contraceptive field.

Since it is becoming more evident that adaptation of the method to the individual patient, often after trial of several methods, leads to greater satisfaction and to greater faithfulness and persistence in pregnancy spacing measures, it is perhaps unfortunate that so many centers report restriction to a single method. In part this is explainable by rural conditions and by the lack of time resulting from the many health procedures for which the staff is responsible.

SUMMARY

Four years after the beginning of the state-wide contraceptive program under

the North Carolina State Board of Health, pregnancy spacing services have been provided for underprivileged women in 47 centers serving 61 counties which constitute 75 per cent of those having health centers. In 1940 those receiving contraceptive instruction numbered 3,233, being approximately 1 out of every 100 married women of child-bearing age, or about 4 out of every 100 underprivileged women in the area served by the health centers. An average of two visits for each patient was recorded. Public health nurses constituted the chief source of referral of the patients. Foam powder and sponge was the most frequently used type of contraceptive, with diaphragm and jelly the next most frequent. More patients were given the service through public health clinics than by any other method, the next largest number by public health nurses sent by the county health officer to the patient's home.

With practically no opposition, pregnancy spacing has become an integral part of North Carolina's public health services. As in the early history of other new health services, the instruction has thus far been requested by only a small proportion of the population. This proportion has been increasing.

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NOTE: We wish to express appreciation to Dr. Clarence J. Gamble for his suggestions in planning the study and for his help in the preparation of the manuscript.

War and Health in Britain*

SIR WILSON JAMESON, M.D., HON. F.A.P.H.A.

Chief Medical Officer of the Ministry of Health, London, England

WHEN I received the invitation of the American Public Health Association to attend its Seventieth Annual Meeting, the Minister of Health, Mr. Ernest Brown, realizing the importance of the occasion, was insistent that I should let nothing stand in the way of my acceptance. I myself appreciate deeply the compliment you have paid me, and I am particularly glad to have the opportunity this evening of thanking you in person not only for the invitation but also for the honor you did me a few years ago in electing me an Honorary Fellow of the American Public Health Association.

If you asked the Medical Officer of Health of one of the large cities in Great Britain how the war had affected his work, he would probably tell you that about 90 per cent of his time was spent on emergency duties and only about 10 per cent on the more familiar tasks of peacetime administration. By this he would not mean to imply that he had almost wholly forsaken the practice of public health but rather that the perfecting of schemes for the prevention of mutilation and death from air attack had tended to take the place of plans for the prevention of disease and that a totally new set of problems had been thrown up in consequence of the war. Health departments with their staff of doctors, nurses and sanitary inspectors

have in the past shown themselves capable of dealing with most types of emergency, so new duties are apt to be placed upon them sometimes to the detriment of their existing and no less important tasks. I shall try to give you some idea of how the work of our public health departments has been affected during the past three years and to show you that the major disasters we feared have not yet occurred, whereas matters we thought of small moment have assumed unexpected importance. In all wars there is a reversion to fundamentals and this war offers no exception to the rule.

First of all we have experienced enormous movements of certain sections of the population from one part of the country to another. During the first 18 months of war over 2¼ million mothers and children in England and Wales were transferred, under official evacuation schemes, from our big cities to smaller towns, villages, and the countryside, where they were in the main billeted in private houses. Many of these people have been evacuated two, three, or even four times for, as bombing became less frequent, there was a drift of evacuees back to the towns from which they came. Well over a million of these people are still in billets. It is fortunate that our housing improvements of the last 20 years gave us the house room to absorb this army without overcrowding, and that our householders accepted this invasion of their cherished privacy with tolerance and good will.

* Address at a Special Session on "Meeting the Public Health Emergency in Great Britain" of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

All this took a great deal of organization and, on the whole, the machine worked with commendable smoothness. But think what it meant to the health services! Maternity and child welfare workers, school doctors, dentists and nurses had to follow the families to the reception areas. Schools, hospitals, clinics, and other premises were insufficient to cope with the great additions to the local populations, so new premises had to be provided. Staffs were hard to find. Difficulties, which in the past had appeared small and easy to deal with, were magnified. Many of the town children were discovered to have lousy heads in spite of the efforts that had been made to free them from vermin. This had to be dealt with promptly in rural areas where facilities for cleansing were not so readily available. Bed-wetting in unaccompanied young children became a problem of first-rate consequence. Scabies increased greatly in incidence. Difficult children—a term which covers a multitude of conditions—required special measures for their management. And all this happened in quiet, peaceful areas where prior to the war little thought had been given to such matters. Yet they have been dealt with. Treatment centers have been established, psychiatric social workers have been appointed, welfare workers have helped with billeting difficulties, and gradually the great experiment of turning the city dweller into a village resident is proving successful. And was not such an experiment well worth all the trouble we have had?

The congestion in the cities of Great Britain has been the cause of all sorts of social evils, and if we can get even a small proportion of our people to return to the land whence most of them originally came we shall have done well. Large numbers of emergency maternity homes have been established up and down the country in safe areas where normal confinements have been con-

ducted with the best possible results. Expectant mothers are billeted near these homes for a few weeks prior to their confinement, and attempts are made, not always with success, to keep the mothers and their infants in the country for some time afterward. We hope many of these country maternity homes will remain as permanent institutions. Then there are hundreds of war-time residential nurseries for children under 5. While no one wishes to see very young children separated from their parents for long periods of time, we think we may be able to retain many of these nurseries as convalescent homes to which children may be sent, in happier days, from our child welfare centers. So far as the value of evacuation schemes is concerned, the main argument in favor of removal of selected groups from target towns lies in the fact that the age group 5–15 years—which has contributed a much higher proportion of evacuees than any other—has shown much the lowest death rate from “enemy action.”

In addition to the official schemes for the mass movement of selected persons, there has been of course a great deal of unofficial movement of people from one area to another. There has, too, been the recruitment of millions of men and women into the fighting services, many of whom have been billeted in various parts of the country. Finally great numbers of men and women have had to be taken from their homes to work in the factories that are everywhere being developed. All these comings and goings of the people have destroyed home life. No one's home is his own—he is either living in some other person's home or sharing his own with total strangers. It requires little imagination to conjure up the possible complications of such a state of affairs, and yet we have endured two years of the war without any obvious deterioration of health—and, it is hardly necessary to add,

with an increasing determination to see this business through to the end. In making evacuation a success the health officer and his staff have played a leading, if unaccustomed, part.

In order to deal promptly and efficiently with air raid casualties and with cases of illness in the services and in evacuated persons, emergency medical, hospital, and laboratory services had to be established. A great deal of additional hospital accommodation was provided by adapting and equipping existing buildings and by erecting hospital huts in the grounds of existing institutions. It is estimated that we have some 400,000 hospital beds in England and Wales available within the Emergency Scheme. So far as possible, additions to hospitals have been made with an eye to their future use in times of peace. The plan that has been developed of transferring much of the hospital accommodation from the center of our towns to situations in the country is one that many of us would like to see a permanent feature of hospital reorganization. Some of our hospitals have been so damaged that they will have to be rebuilt. It would be folly to rebuild them on crowded and unnecessarily expensive sites. With modern means of transport it is possible to move patients in comfort considerable distances, and I for one look forward with confidence to some redistribution of our hospitals in the years to come.

It was thought necessary at first to keep large numbers of beds empty and staff standing by, ready for the reception of casualties of all kinds. Experience so far has shown that we overestimated the need for such a big reserve. The result has been that these hospital beds have been used more and more for civilian sick and we are rapidly getting something in the nature of a national hospital service—without our being fully aware of the change that is taking place. As these hospitals are

grouped and administered, for wartime purposes, in regions, we are coming to the belief that the proper method of providing adequate hospital services for the benefit of the public is on a big regional basis, and already schemes are being discussed for future hospital provision on these lines. As our counties and cities own many large hospitals, medical officers of health are of necessity intimately concerned with such proposals and are helping to solve the problem of so coördinating the work of both voluntary and municipal hospitals that the public will get the best possible service.

We very naturally dreaded the appearance of serious epidemic disease in the unusual conditions in which people were living, and in order to assist early diagnosis we established a system, under the management of the Medical Research Council, of emergency public health laboratories covering the whole country. Some of these laboratories were new creations; others, which had been in existence for years, were brought into the scheme. As a result every medical officer of health has now a first class laboratory within a maximum radius of 30 miles. Not only does the laboratory do all the bench work needed, but the staff go out and help with the field work. This is in the best tradition of your own admirable United States Public Health Service, and it will be a great disappointment to me if we do not retain these indispensable epidemiological units after the war.

I am delighted to tell you that the most complete of all these units at our disposal is the American Red Cross Harvard Field Hospital Unit under the direction of our mutual and respected friend Dr. John Gordon, Professor of Preventive Medicine in the Harvard Medical School. This unit not only provides us with some 130 beds in novel and efficient prefabricated buildings; it gives us as well a first class laboratory and mobile epidemiological teams of

doctors and nurses. Already we have used these teams in various parts of England and it is of interest, though I really do not know why we should have imagined otherwise, that such a team, immediately on arrival in England and without spending any time on local introductions, can set about the difficult task of case finding and follow-up in a typically British town. In so doing I am assured that they feel just as much at home and meet with just as much success as they would in their own part of the world. Dr. Gordon has been appointed official U. S. A. Liaison Medical Officer with the Ministry of Health and his advice and help are being constantly sought. Public health in America could have made no more valuable contribution to our war effort than by sending us this admirable unit. I hope to see much of its practice embodied subsequently in our own epidemiological plan.

One of our fears was that, with the inevitable damage to water mains and sewers by bombing attacks, there would be a great increase in the incidence of typhoid fever. Happily this fear has not been realized. In London, for instance, every type of water main has been broken in every conceivable manner. Sewers have emptied their contents into large trunk mains and polluted the water over great distances. One main, 4 feet in diameter, has been broken no fewer than eleven times, and the number of times mains have been damaged amounts to thousands. This is understandable when we recollect that the system of mains in London is over 8,000 miles in length. The disinfection of mains under repair by means of chlorine, in a strength of 10 p.p.m. and with a period of contact of 15 minutes, has, however, proved an excellent safeguard, and I am happy to say that neither in London nor elsewhere has there been any outbreak of typhoid fever due to damage to mains and sewers as a result

of air raids. On the other hand, we have had quite a number of epidemics of paratyphoid fever traceable in a majority of instances to infection associated with premises where bread and various kinds of pastries are made.

The war has helped us to make real progress with our scheme for the immunization of children against diphtheria. Last November the Government decided to issue supplies of alum precipitated toxoid free to all health authorities and this provided the necessary official backing and stimulus for the movement. I cannot give you the figures of the numbers immunized so far—we have called for returns up to the 30th September—but we have evidence that a great deal has been accomplished in the past eight or nine months. We are finding difficulty, of course, in bringing in the children below school age in sufficiently large numbers, but we hope that with continued publicity even this trouble will be overcome.

In addition to devising a hospital and laboratory system to meet our anticipated needs we had, of course, to work out a whole scheme of air-raid precautions—or, as we now know it, A.R.P. This meant the creation of first aid or stretcher parties who travel at once to the scene of what is called "an incident" and assist in finding casualties and in applying the necessary first aid treatment. First aid posts had to be established, to which the less severely injured are directed. Ambulance services had to be built up, air-raid shelters had to be provided, and cleansing centers for decontaminating persons affected by mustard gas had to be planned. In addition rest centers for bombed-out persons had to be found and equipped, and there are now some 13,000 of these in Great Britain with accommodation for over a million people. A large staff had to be assembled and trained and retrained in the light of new knowledge

and experience, and in all of this the medical officer of health was heavily involved. Indeed, it is this work that has occupied by far the greater part of his time in certain areas.

The air-raid shelter problem has been one of no little difficulty. Domestic shelters and street surface shelters had been prepared against the onset of raids, but when night bombing began a year ago the public took the law into their own hands and invaded deep "tube" stations and other underground spaces where they felt themselves to be in greater security. These places had not been prepared as dormitories, and sanitary and other arrangements were sadly lacking. Soon, however, provision was made for proper equipment and supervision. Large numbers of shelters have been fitted with bunks; water flushed toilets have been installed where possible; medical aid posts have been established in all large shelters with doctors and nurses in attendance—incidentally much health education work is carried on and many children have been immunized against diphtheria in these shelters; canteens are available and entertainments of various kinds provided. And now it is right to say that reasonable shelter provision has been made for a very large mass of the people. For example, by last April the total capacity of public and domestic shelters in the county of London amounted to $2\frac{1}{2}$ million persons. A census taken on the 7th of April showed that some 23 per cent of the people spent the night either in public shelters or in privately provided domestic shelters—about 8 per cent being in public shelters including the deep "tube" stations. The rest of the people just stayed in their own homes or else used shelters provided by private means. It is of interest that we have had no epidemic disease associated in particular with shelter users nor has the incidence of vermin among such persons increased.

THE INDUSTRIAL WORKER

So far this war has been for us a war in which industrial workers have played an almost larger part than the members of the fighting services. It is fitting therefore that I should say something of the conditions under which industry is being carried on and of the health of the persons employed. One of the penalties of a democracy appears to be that it takes a long time to get into its proper stride. This was so in Great Britain but the pace has been steadily increased and a gigantic effort is now being made. There have been many difficulties to overcome. New factories have had to be built, often in remote parts of the country. Workers have had to be drafted to them, and living accommodation found or provided for them in the neighborhood, or special means of transport to and from their homes arranged. Many workers have joined the Services, so new entrants to industry have had to be trained, and women in large numbers are taking the place of men. All factories have to be blacked out as a precautionary measure against air raids—this raises problems of lighting and ventilation. Bombing attacks may be made while people are going to or leaving their work. Shopping for the family becomes very difficult when the women-folk are employed in factories. Young children must be cared for while the mothers are at work, so wartime day nurseries are being everywhere established—often with the generous help of American well-wishers. Special arrangements have to be made for medical care and welfare work in the new factory areas.

After the evacuation of Dunkirk and the collapse of France in May, 1940, a tremendous effort was put forth by industry. Longer and longer hours were worked, and it is interesting to record that in many factories there was actually a higher hourly output of work at the

same time. This, however, as we knew from experience, could not last, and gradually output began to fall as a result of strain and fatigue. Time began to be lost through sickness and injury and workers became stale. Had the long hours continued there would undoubtedly have been a serious effect on health and efficiency. So a reduction of hours was introduced and some provision was made for holidays. It is true to say that there is little to gain and probably more to lose when the weekly hours of work exceed 60-65 for men and 55-60 for women.

In spite of what our people have been through, I am glad to have the assurance of the Senior Medical Inspector of Factories that he finds no evidence that in general the health of the industrial worker has suffered materially. War conditions have, of course, resulted in the increase of certain industrial poisonings. The most noteworthy increases are associated with the processes involved in the manufacture of T.N.T. and are revealed in aniline poisoning, toxic jaundice, and in poisoning from nitrous fumes. There is, too, a higher incidence of poisoning from carbon monoxide owing to the greater use of blast and other furnaces in the making of munitions. In order to safeguard the health of factory workers the Minister of Labour has issued an order making compulsory, when thought necessary, medical supervision and nursing and welfare services in any factory concerned with the manufacture of munitions of war. In consequence, well over 100 full-time and nearly 400 part-time doctors have been appointed in munition factories as well as very large numbers of nurses. Welfare work too is spreading rapidly both within, and in the districts surrounding, factories. It is satisfactory that many factory owners who originally accepted such supervision with great reluctance have later expressed their appreciation of its prac-

tical value. We hope this increase in medical care and in welfare work in factories will become a permanent part of our industrial organization.

Before I leave the subject of industry, may I quote a few words from a report by the Senior Medical Inspector of Factories? Speaking of women he says,

Of their keenness to do what they are required to do I have nothing to add to what is general knowledge, and, so far as it is possible to judge, the work upon which they are employed is well within their capacity. The idea that the ordinary conditions of work must be improved because women are to be employed is, I consider, unsound. In general, if the conditions are unsuitable for women they are equally unsuitable for men. It is true that some types of work are of themselves unsuitable for women but that is an entirely different matter. At present there is work that has to be done that is a hazard to health and to life, both to men and to women, whatever precautions may be taken. The women, I believe, are willing to share this risk with the men.

SPIRIT OF THE CIVIL POPULATION

You may ask how the civil population have stood up to the frightfulness they have had to endure. I may say right away that their spirit has been splendid and that, if anything, the women are even stouter-hearted than the men. As regards neurotic illnesses, here are the conclusions reached in a quite recent report to the Medical Research Council:

Air raids have not been responsible for any striking increase in neurotic illness. Crude figures from hospitals and outpatient clinics even suggest a considerable drop.

Reliable data from London and Bristol, and the impressions of good medical observers, indicate that after intensive raids there is a slight rise in the total amount of neurotic illness in the affected area, occurring chiefly in those who have been neurotically ill before. Neurotic reactions may not show themselves for a week or ten days after the bombing; they usually clear up readily with rest and mild sedatives. Hysteria is uncommon, anxiety and depression are the commonest forms of upset.

The incidence of neurotic illness has been low in fire-fighters and other workers in Civil Defence.

Insanity has not increased, so far as figures are to hand, though more persons with senile deterioration have been admitted to mental institutions than before, because their relatives could not any longer look after them or the raids had in other ways disturbed their routine and their precarious adaptation. The same was true of some defectives.

Suicide has diminished both in England and in Scotland.

It is impossible to distinguish between neurotic illness due directly to air raids and that which may follow such secondary troubles as disruption and loss of one's home, evacuation, difficulties in transport to and from work, or temporary loss of employment. It is to the war as a whole, with its accumulated stresses, that people have had to adjust themselves, and signs of failure to do this can be taken as warning signals of neurosis. An increase in alcoholism would be such a sign: there is no evidence that there has been any increase of this sort. The rise in road and industrial accidents has been considerable: many causes are at work, the psychological ones among which have not been analysed. There has similarly been a rise in juvenile delinquency: this cannot be regarded as tantamount to a rise in juvenile neurosis, but it suggests that the same environmental factors are at work as conduce to neurosis.

FOOD RESTRICTIONS

And now a few words about rationing and how the people are faring in spite of some food restrictions. Only certain foods are rationed; these are meat, bacon, margarine, lard or cooking fats, cheese, tea, sugar, and jam. We have to register for milk and certain categories of the population are given priorities for milk, viz: expectant and nursing mothers and children up to the age of 18. Adults get what is left over, while persons suffering from certain kinds of illness have special privileges. Under the National Milk Scheme, mothers and children under 5 may obtain a pint of milk a day at a price of just over three cents or, if need be, free. School children, under the Milk in Schools Scheme, may purchase, or be given without charge, in school, two-thirds of a pint daily at a cost of less than one cent for one-third of a pint. These school

children, together with young persons between the ages of 14 and 18, may have delivered to their homes an additional half-pint of milk a day at the ordinary retail price (at present about seven cents a pint). During this year more than 3 million persons have benefited under the National Milk Scheme—276,000 expectant mothers, 73,000 infants under 1 year, and 2,700,000 children aged 1 to 5. In addition, 2¾ million children are getting milk under the Milk in Schools Scheme.

A national wheatmeal loaf, made from 85 per cent extraction flour, is marketed at the same price as white bread, and the medical profession has always urged that it should be made the standard issue for the country. It has, however, been decided as a matter of policy that both types of loaf should be available, but that white flour should be enriched by the addition of thiamin. Vitamins A and D are added to all margarine, and preparations containing vitamins A, C, and D are available for all expectant and nursing mothers and for young children.

A careful survey of the diets of 103 London families made in the spring of this year showed interesting results (Table 1).

The fact is that for a beleaguered citadel we are being very well fed indeed. There are difficulties in the distribution of foodstuffs. In some districts shopping is a much more troublesome business than in others. But sufficient food is either being produced in or is being brought into Great Britain to keep us all in good heart and fit for a pretty heavy day's work. The best way of overcoming distribution difficulties is, we think, by extending communal feeding. One of our aims is to provide as many children as possible with a mid-day meal in school—I believe this will become a permanent part of our educational program. At present about 6 per cent of our school children are having

TABLE 1
Consumption of Nutrients per Diet Head Daily

<i>Food Expenditure per Diet Head Weekly</i>	Calories	Protein	Carbo- hydrate	Fat	Calcium	Iron	Vitamins I.U.		
		g.	g.	g.	g.	mg.	A	B ₁	C
Under 5/— (A)	1,740	49	248	57	0.37	7.5	2,341	258	758
5/— to 7/— (B)	2,090	59	280	75	0.51	9.3	2,675	326	953
7/— to 9/6 (C)	2,405	70	303	94	0.60	12.0	3,646	403	1,046
Over 9/6 (D)	2,747	79	352	105	0.77	12.1	3,847	452	1,254

*Actual Intake Expressed as Percentage of Requirements
Based on League of Nations Standards*

<i>Food Expenditure per Diet Head Weekly</i>	Calories	Protein	Calcium	Iron	Vitamins		
					A	B ₁	C
Under 5/— (A)	80	80	34	75	79	98	128
5/— to 7/— (B)	91	95	48	95	90	125	162
7/— to 9/6 (C)	105	110	56	117	124	154	180
Over 9/6 (D)	120	128	77	124	130	173	216

a school dinner. The numbers are increasing rapidly and we hope during this winter to feed many more. Canteens for factory workers, miners, dockworkers, and building operatives are springing up everywhere. Nearly all the factories in which we can require the establishment of canteens serving hot meals have already made, or will shortly have made, such provision. British restaurants, financed by Government, where the whole family may get a good meal at a cheap rate already number over 1,000—another 400 will soon be opened. All these arrangements tend to make possible the eating of one square meal a day and enable the women of a household to enter industry without the worry of knowing how their families are to be fed. Of course, it is not easy to get together the equipment needed for communal feeding on such a vast scale, but it is being done with all possible speed. The old idea that an Englishman's house was his castle behind the walls of which he secured himself against all comers is no longer true. He has to share his castle with any person who may be officially billeted on him and, more than that, he may no longer eat his roast beef before his own fireside. If he wants a good meal at a

cost within his means he may have to collect his bowler hat and his umbrella and betake himself to some communal feeding center. We are becoming a very different people from the race Continental caricaturists poked fun at for so many years.

ASSESSMENT OF NUTRITION

It is not sufficient to make dietary surveys and to calculate the calorie and other values of the food eaten. We must make as best we can some kind of actual assessment of nutrition in groups of the population in various parts of the country. The method of clinical assessment originally advocated by the Board of Education in respect of school children is much too dependent upon the whims and fancies of individual investigators. Some more accurate method must be used. We have a group of nutritionists at Oxford who are trying to elaborate the necessary technic which must, I think, be a combination of dietary survey, laboratory control, and clinical examination. In this connection we are getting much help from The Rockefeller Foundation and I hope that before long we shall be able to send teams of trained workers to selected areas to search for the early and so far

elusive signs of nutritional deficiencies. Up to the present I think I can say that with the means at our disposal we have not been able to find evidence that our people are suffering in any degree from malnutrition. I should be foolish, however, to feel easy in my mind as to the future. The margin of safety we possess must be very small.

A great deal of food educational work has been going on. The Ministry of Food and the Board of Education have taken a prominent part in this, and I cannot speak too highly of the way in which the teachers of domestic subjects have gone out into the homes and the market places to give instruction to the public. Large new groups of people are becoming to some extent social workers and I have no doubt the experience will be of permanent benefit to them. Indeed, the whole of our health educational program has been stimulated by the war.

TRAINED MAN POWER

To keep all these wartime activities moving and to maintain existing services at as high a pitch of efficiency as possible has made enormous demands on our trained man power—and nowhere more than in the case of doctors, dentists, nurses, and other officials of our health and medical departments. We have had endless difficulties over doctors and at the present moment we have a committee of well known medical men drawn from civil practice and from the Services actively engaged in trying to secure a better utilization of our diminishing resources. Indeed, members of the committee are travelling about the country in an endeavor to see for themselves whether Service and civilian needs cannot be pooled and dealt with by a single medical staff, and whether reductions in what are considered minimum establishments cannot still be made. It is no easy matter to provide medical officers for our fighting services and for

all the special kinds of work connected with first aid, shelters, emergency hospitals, and the like thrown up by the war—in addition to retaining enough doctors to care for the civil population. Large numbers of women are joining the Civil Nursing Reserve and being given some training in nursing, but the competition of the uniformed women's services and of industry is very strong. Casualty work, of course, has its slack as well as its busy periods, and it is hard to determine what is exactly the insurance we should provide in the way of trained personnel standing by to meet any sudden emergency.

I began by saying I would try to show you how the work of the medical officer of health had been affected by the war. I should like to close by saying that our health services have stood up well to the additional tasks placed upon them. Normal services have continued to function. Infectious disease during the war has, fortunately, been no more than average. We must, however, keep always in mind the possibility that we may be living on the resources we have built up over a period of years. The increase in the incidence of tuberculosis, with the heaviest mortality falling on the female age group 15-25, gives us concern and we are trying to determine the possible causes of this increase. We must ever be on the watch for these unfavorable trends.

We may have been slow to realize that war in Europe was inevitable and slow to appreciate the magnitude of the issues even once the battle had been joined. There is now no misunderstanding of the situation. Every man and every woman knows that if this war is to be won it can be won only by each one putting forth the greatest effort of which he is capable. This is what we are approaching now. Those of us who are in some measure responsible for the planning of things are constantly looking to the future and endeavoring so

to meet the present emergency as to derive some permanent good from the measures we adopt. For war, though a great destroyer of things worth pre-

serving, may yet almost overnight open the door to progress and reform that in peacetime would have meant years of constant striving.

CHRISTMAS SEALS



*Protect Your Home
from Tuberculosis*

Nutrition in Relation to Pregnancy and Lactation*

J. ERNESTINE BECKER, HUGH J. BICKERSTAFF, M.D.,
M.P.H., F.A.P.H.A., AND NICHOLSON J.
EASTMAN, M.D.

Associate in Biochemistry; and Associate in Public Health Administration, School of Hygiene and Public Health; and Professor of Obstetrics, Medical School, Johns Hopkins University, Baltimore, Md.

THERE is no longer any doubt that fertility and nutritive efficiency are intimately related. One of the criteria of dietary adequacy employed generally by students of nutrition is the ability of animals to reproduce and rear young successfully throughout succeeding generations. Stock raisers and animal husbandrymen have long appreciated the value of providing their breeding animals with a food allowance of superior quality. The practice in the highlands of Scotland of supplementing the food of the sheep just before the period of the annual estrus is said to increase materially the fertility of the flocks.

Though it has been recognized for

many years that extreme poverty of diet or the extreme deprivations of war or famine affects both fertility and birth weight in humans, the effects of specific dietary deficiencies and of suboptimal nutrition on pregnancy and lactation in women have only recently received intensive study. The abundance of evidence obtained from animal experimentation, the marked improvements in experimental and clinical technics, and the ever widening interest in nutrition have stimulated a keen desire for exact information on the rôle of diet in human reproduction and lactation. For the worker in the field of public health such information is of paramount importance.

A comprehensive review of the die-

TABLE 1

Recommended Daily Allowances for Specific Nutrients
Committee on Food and Nutrition, National Research Council

	Calories	Protein gm.	Calcium gm.	Iron mg.	Vitamin A I.U.	Thiamin (B ₁) mg.	Riba- flavin mg.	Nicotinic Acid mg.	Ascorbic Acid mg.	Vitamin D I.U.
Pregnancy										
latter half	2,500	85	1.5	15	6,000	1.8	2.5	18.0	100	400-800
Lactation	3,000	100	2.0	15	8,000	2.3	3.0	23.0	150	400-800

* Read before the Food and Nutrition and Maternal and Child Health Sections and the Oral Health Group of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

tary requirements in pregnancy and lactation was prepared by Garry and Stiven¹ in 1936. More recently, after a critical study of the literature, the

Committee on Food and Nutrition of the National Research Council has set up dietary allowances for people of different ages.² Since the purpose of this paper is to set forth in review the present-day knowledge of nutrition in relation to pregnancy and lactation, it seems profitable to consider in some detail the allowances set up by this committee, which are presented in Table 1.

ENERGY NEEDS OF THE PREGNANT WOMAN

Let us first consider the energy needs of the pregnant woman. The consensus among investigators is that there is a decrease in heat production in early pregnancy. After the third or fourth month there is a steady rise. Shortly before delivery the basal metabolic rate may be increased by as much as 25 per cent, but curtailment of activity at this period offsets this increased basal.

Obstetricians generally agree that pregnancy should involve a gain of no more than 20 to 25 pounds. Studies of Stander and Pastore,³ however, indicate that normal pregnant women experience gains proportionate to their original size. A daily intake of about 2,500 to 2,800 calories readily meets the total energy needs of the average pregnant woman. Under continuing observation, bearing in mind relative as well as absolute increase, and rapidity as well as amount of gain, adjustments to meet individual needs may be made without detailed calculations.

The rapid weight gains associated with toxemias of pregnancy cannot be attributed to overeating. Such weight increase is of sudden and rapid onset and is pathological in contrast to the more gradual weight gains that characterize uncomplicated pregnancy.

Rarely, for the very obese pregnant woman, a low calorie diet may be necessary. In such cases *calories only* should be limited and the same amounts of protein, minerals, and vitamins must

be provided as are recommended for the woman of normal weight. This involves special dietary calculations. Effort to limit the size of the fetus by restricting the food intake is rarely effective. Furthermore, it carries the serious risk of inducing nutritional deficiencies in both mother and child.

The recommendations of the Committee on Food and Nutrition do not indicate what proportion of the total calories should be derived from carbohydrate and fat. It is probable that the levels of these foodstuffs that have long been considered as desirable in the diet for the non-pregnant adults are likewise to be employed in pregnancy, *i.e.*, 50-70 per cent of the total calories from carbohydrate and 20-35 per cent from fat. References in the literature allude to a tendency toward lowered glucose tolerance and glycosuria and increased accumulation of acetone bodies and tendency toward ketone acidosis as concomitants of pregnancy.⁴ However, such tendencies are not pronounced enough to justify any radical change in the carbohydrate and fat content of diets for normal pregnant women.

PROTEIN INTAKE DURING PREGNANCY

The idea prevails quite generally that excess of protein exerts a harmful effect in human pregnancy. Not infrequently the toxemias of pregnancy are attributed to the too liberal consumption of meat. In consequence, many practising obstetricians advocate some restriction of meat ingestion. On the other hand; Strauss⁵ asserts that a diet low in protein may be a cause of pregnancy toxemias, and reports clinical cases successfully treated by a high protein diet supplemented by thiamin and liver.

It has been reliably reported that total net nitrogen requirement, over maintenance requirement, during pregnancy is about 135-145 gm. In addition, the maternal organism tends to store nitrogen far in excess of this

theoretical requirement. Macy and her coworkers⁶ have called attention to the fact that in women the greater the retention of nitrogen in the latter part of pregnancy, the greater the likelihood of a sufficient milk supply. Thus, in the light of present-day knowledge and experience a generous rather than a restricted protein intake is to be recommended.

MINERAL REQUIREMENTS

Experimental evidence indicates that thirteen or more mineral elements are essential for human nutrition. Calcium, phosphorus, iron, and iodine have been studied the most extensively, and it is believed now that if these are provided in sufficient amounts in the daily diet the other nine or so will be present in satisfactory amounts. Actually, since phosphorus is an almost invariable constituent of protein, a sufficiency of the latter is a guarantee of an adequacy of the former. Except in regions of endemic goiter, iodine need receive no special consideration. In such areas the use of iodized salt is usually advocated.

That pregnancy exerts a drain on the calcium and phosphorus supplies of the mother is a demonstrated fact. Experiments on farm animals indicate that both of these elements are necessary for normal fertility and the birth of normal young. According to evidence cited by Maxwell and Miles⁷ infants born of mothers with osteomalacia usually are osteoporotic and later develop rickets. True fetal rickets may also occur, accompanied by gross hypoplasia of the enamel of the teeth and defective dentine formation. Evidence of a similar nature has been obtained by a number of other investigators. In a recent study, Burke⁸ has noted that 11 children with perfect teeth at 6½ years of age were the offspring of mothers whose daily diets during pregnancy included at least one quart of milk, in contrast

to a group of 12 children with the largest number of defective deciduous teeth at 3 years of age whose mothers' diets included 1 pint of milk or less per day.

Studies have shown that the calcium content of the fetus at term is about 25 gm. Authorities generally agree that 0.68 gm. of calcium a day meets the needs of the normal adult. To avoid robbing the tissues of the mother and to assure storage, an ample excess over these combined requirements should be provided. In view of these facts and in consideration of evidence afforded by balance studies during pregnancy, it is safe to assume that the suggested allowance of 1.5 gm. of calcium per day suffices.

Attention should also be directed to the fact that there is some evidence that the calcium and phosphorus from milk is better than from other foods and that it is difficult, if not practically impossible, to supply in other foods amounts equivalent to what can readily be supplied in milk. Calcium in the form of its salts is not as effectively utilized as the calcium of milk, and at usual retail drugstore prices costs more than the same amount acquired from milk. Furthermore, when given in this form none of the additional nutritional value of milk is obtained.

It has long been recognized that the human infant and the young of other mammals at birth are supplied with a store of iron sufficient to carry them through the early months of life. Since the maternal organism supplies this iron, as well as that needed for the growth of the fetus, it is only logical that iron requirements are increased in pregnancy.

The drain upon the mother to supply the needs of the fetus, together with the rather frequent occurrence of pregnancy of gastric hypo-acidity, and the use of diets often inadequate in iron, may account for much of the anemia

so common in pregnancy. In substantiation of this is the observation of Wills⁹ that there is a greater incidence of low hemoglobin values in pregnant women on low incomes, and that the blood hemoglobin level can be maintained at satisfactory levels from the fifth month to the end of pregnancy by the administration of iron. Similar evidence is offered by Corrigan and Strauss¹⁰ who showed that the blood of apparently normal pregnant women can be considerably improved by supplementation with iron. Burke¹¹ cites the case of a woman whose diet was carefully followed through three pregnancies. She states:

When first seen she consumed a diet rated "fair" in iron. This was toward the end of the second trimester of the first pregnancy. She had improved her iron intake to "good" during the latter part of the first pregnancy. In the second pregnancy she took a diet rated "good to excellent" in iron and had iron medication from the 6th month to the end of that period. In her third pregnancy she received no iron medication but had taken a diet "excellent" in food iron throughout this third pregnancy, using such foods as liver, apricots, molasses, lean meat, leafy greens, whole grain bread and cereal, etc., liberally. In each pregnancy she showed a higher hemoglobin level than at the previous pregnancy.

Improvement of the hemoglobin levels of the three children in the first 6 months of infancy paralleled that of the mother during her successive pregnancies.

In arriving at an adequate iron intake for the pregnant woman as in the consideration of all other dietary essentials, the factors of availability, absorbability, and interrelationships must be recognized. There is general agreement that iron to be absorbable must be soluble, ionizable, and ultrafilterable. Such forms are reduced iron, salts soluble in acid solution, and the hydroxides of iron, which are readily changed to salts by acids. Also ferric iron becomes available only when

hydrochloric acid is present in the stomach, since in achlorhydria anemia occurs. Thus, as cited by McCollum, Orent-Keiles, and Day,¹² of the estimated iron in dry pork liver, 67 per cent is available; of that in dry oysters, 22 per cent is available; while of that in egg, molasses, raw carrots, apples, peaches, pears, 100 per cent is available.

A nutritional anemia can be produced by a diet inadequate in the quality or quantity of its protein. Anemia also develops on a diet deficient in vitamin A or ascorbic acid or one where the calcium:phosphorus ratio is unfavorable. It has been estimated that the iron contribution of the mother during pregnancy is 400 to 600 mg. and that the diet of the pregnant woman should provide for the absorption and utilization of 500 mg. of additional iron. A daily intake of 15 mg. of iron is thought to meet these demands. Practically speaking, a diet selected to meet the needs for protein and the various vitamins usually provides more than 15 mg. of iron. If, in spite of the above precautions, anemia exists, an iron supplement may be imperative.

Metabolism studies indicate that in pregnant women the sodium balance is usually positive and more than adequate for fetal needs. Because there is a definite relationship between the amount of salt eaten and the water retained by the body and because in pregnancy the tissues show a marked avidity for water, many obstetricians advocate the curtailment of salt intake. It is a judicious practice to restrict the use of salt to that amount used in cooking and to prohibit the use of additional salt at the table, with more stringent restriction in the event that rapid weight gain or other evidence of water retention appears.

FLUID INTAKE

Obstetricians generally indorse an ample fluid intake during pregnancy.

If for no other reason than overcoming urinary stasis incident to the loss of tone of bladder and ureters during pregnancy, fluids are important. The dictum of a liberal fluid intake often loses emphasis by its very generality. About two quarts of liquids daily are recommended. The daily use of one quart of milk, already alluded to, will furnish half of the fluid and the other half can be most acceptably provided by water, soup, fruit juices, and beverages.

VITAMIN REQUIREMENTS

In the recommended daily allowances, estimates are given only for vitamins A and D and thiamin, riboflavin, nicotinic and ascorbic acids. The committee² states:

In addition to the three factors of the B complex included, other members of the group, such as vitamin B₆ and pantothenic acid should be given consideration. But at the present time no specific values can be given for the amount required in the human dietary. It should be added, however, that foods supplying an adequate amount of thiamin, riboflavin and nicotinic acid will tend to supply an adequate amount of the remaining B vitamins.

It is safe to assume that a diet deriving the aforementioned essentials from *natural food sources* will provide adequate amounts of the less well known factors.

The suggested allowance for vitamin A represents an increase of 20 per cent above that for the average adult. This estimate is based chiefly upon clinical tests on non-pregnant adults. Experimental investigations and observations on humans have demonstrated that the chief function of vitamin A is the preservation of the integrity of epithelial membranes. Probably as a result of the protection of these membranes, vitamin A serves indirectly to lessen susceptibility to infection, especially of the respiratory and genitourinary tracts.

Garry and Stiven¹ cite several references to the beneficial effects of concentrates of vitamins A and D in reducing the tendency to puerperal sepsis. Vitamin A deficiency in animals results in disturbance in the estrus cycle in females, prolonged gestation, and fetal death. In males, testicular degeneration occurs which can be alleviated by the subsequent administration of vitamin A. Inclusion in the daily diet of whole milk, butter or fortified margarine, eggs, green, leafy, and yellow vegetables insures a vitamin A intake considerably in excess of that advocated by the Committee on Foods and Nutrition of the National Research Council.

There is an extensive literature on the rôle of thiamin in pregnancy. Some of the abnormalities described in experimental animals are undoubtedly due to multiple deficiencies, but it is an established fact that animals, and probably humans, on thiamin-deficient diets give birth to young which shortly after birth exhibit symptoms characteristic of polyneuritis. The increased demands of pregnancy, too, are frequently sufficient to produce symptoms of thiamin deficiency in pregnant animals on diets on which non-pregnant animals show no visible signs of polyneuritis.

In recent years there has been a growing belief that some of the pathologic conditions developing during pregnancy are manifestations of deficiency of one or more of the constituents of the B complex. Polyneuritis of pregnancy is undoubtedly a dietary deficiency similar to beriberi, and therapy should aim at provision of the deficient nutrients, especially the vitamin B complex. Marked improvement or disappearance of the polyneuritic manifestations occurs in many cases following thiamin treatment.

As stated by McCollum, Orent-Keiles and Day¹²:

The polyneuritis of pregnancy would seem to have its origin in several causes or associated factors, among which are anorexia and vomiting of pregnancy. Plass and Mengert have pointed out that in the forcing of high carbohydrate diets on patients with vomiting or pregnancy there would seem to be increased risk of producing vitamin deficiencies. Depletion of thiamin, of course, might be expected, since carbohydrate foods tend to increase the requirements for this nutrient.

Because of the increased need for thiamin, and especially because of its rather limited distribution in common foods, it is of paramount importance that whole grain breads, whole grain cereals, lean meat, eggs, peas, beans, lentils and other vegetables and fruits are accorded a conspicuous place in the diet of the pregnant woman.

Recently both riboflavin and nicotinic acid have been shown to have specific rôles in human nutrition. It is known that the former is effective in the prevention and cure of a specific keratitis and lesions at the angles of the mouth and nose. Nicotinic acid is frequently called the antipellagra factor because its absence or inadequacy is the chief, but probably not the only, factor involved in the causation of human pellagra. Reliable data for the absolute amounts of riboflavin and nicotinic acid required for normal nutrition are lacking at this time. However, the provision of protein and thiamin in sufficient amounts and from natural sources give assurance of adequate quantities of riboflavin, nicotinic acid, and the other constituents of the B-complex.

Increase in metabolic rate is invariably accompanied by a need for increased amounts of ascorbic acid. There is an increased metabolic rate after the first trimester of pregnancy and it has been established beyond a doubt that pregnant and lactating women need considerably more ascorbic acid than do non-pregnant adults.

Neuweiler¹³ has described ascorbic acid excretion studies on non-pregnant, pregnant, and lactating women which he conducted in order to estimate the requirements during pregnancy and lactation. He found it was necessary for the pregnant and lactating women to ingest considerably larger amounts of the vitamin in order to maintain an excretion level regarded as indicative of adequate vitamin intake. The studies of Teel and coworkers^{14, 15} corroborate the findings of Neuweiler. The daily consumption of citrus fruits, tomatoes, and other raw fruits and vegetables will provide in palatable form the necessary ascorbic acid.

It is generally agreed that vitamin D is needed throughout life, the requirement being greatest during infancy and during pregnancy and lactation. The main function of this vitamin is its rather spectacular regulation of calcium and phosphorus metabolism. When it is present in optimum amount it brings about the maximal utilization of these two minerals. It is a vital factor in the prevention and cure of rickets and in the maintenance of a sound skeletal structure throughout life. It undoubtedly plays an important rôle in the building of sound, caries-resistant teeth. If it performed no other functions than those enumerated its inclusion in the diets of pregnant and lactating women is essential.

Unlike the other dietary essentials, vitamin D is not widely distributed in natural foods. Indeed, it is the one factor that one must obtain from sources other than the food supply. Fish liver oils are commonly employed to supply this vitamin. In the Temperate Zone it is customary to prescribe a vitamin D supplement from October through April.

The rôle of vitamin E in the prevention of sterility in rats, cows, sows, and other animals, and as a factor of importance to the hatchability of hen's

eggs has been demonstrated. Some clinical reports have appeared which suggest that wheat germ oil, a rich source of vitamin E, is of value in preventing spontaneous abortions in women. Satisfactory controls are lacking as is so often the case in human nutrition studies. The distribution of vitamin E is such that a diet containing insufficient amounts would no doubt also lack other factors essential for a successful pregnancy. Where its administration in large amounts has proved effective in combating spontaneous abortion one wonders whether some metabolic perversion exists necessitating an intake so much greater than that which is considered normal.

There is as yet no generally accepted unit of vitamin E. The Committee on Food and Nutrition of the National Research Council have set up no allowances probably because of insufficient evidence of its rôle in human nutrition and the lack of a satisfactory unit of measurement and methods of assay.

No allowances have been set up for vitamin K as yet. However, its place in human nutrition has been definitely established. It is essential for the maintenance of a normal plasma prothrombin level and is an important factor in regulating the clotting time of the blood. Although a diet of natural foods seems to provide sufficient vitamin K for the normal person, circumstances may arise in pregnancy when this is insufficient. It has been shown that the administration of this vitamin, in pure form antenatally to the mother, effects a marked reduction in the hemorrhagic diathesis and cerebral hemorrhage in the new-born. Hence the routine use of vitamin K may well become a valuable addition to obstetric practice.

LACTATION

Throughout pregnancy the maternal organism is called upon to provide

nourishment for the fetus. Lactation is but a continuation of this function through the medium of the milk supply rather than the placenta. As the child grows the need for nourishment is increased many times over that of fetal life. Consequently, larger amounts of all those nutrients that have been stressed as being essential for successful pregnancy are needed for the establishment of a milk supply of high quality. Abundant evidence exists demonstrating that the milk supply of any lactating animal is markedly affected by diet. Insufficient calories and inadequate protein reduce the quantity of milk produced; inadequate amounts of minerals serve chiefly to rob the tissues of the lactating animal; and inadequate amounts of any of the vitamins reduce the quality of the milk in so far as that specific vitamin is concerned.

SUMMARY

Enough evidence, both clinical and experimental, has been cited to call attention to the importance and need for sound dietary advice and practices throughout pregnancy and lactation. Almost every pregnant woman is sufficiently interested in her own health and that of her child to be willing to follow any practice that will lessen the hazards of pregnancy and aid in the building of a fine baby. She needs advice of a definite, positive kind, advice that she is capable of understanding and that she has the financial means of following.

It is not enough to state "no special diet is required during pregnancy. If you are accustomed to eat nutritious and easily digestible food in properly balanced proportions, no change in your dietary routine is necessary." How does a mother know whether her food is nutritious and in properly balanced proportions. The taking of a detailed dietary history several times during

pregnancy, followed by suggestions and help in the making of necessary changes, would seem as important a procedure in the management of pregnancy as the physical examination and medical history.

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What Is Happening to Social Gains of the Last Ten Years?*

MARY VAN KLEECK

Director of Industrial Studies, Russell Sage Foundation, New York, N. Y.

MORE than any other aspect of the general welfare, it is in public health that science confronts the social sciences. For public health is collective health, and the purpose of the public health movement is to promote the application of the results of science by and for the community. In this process of application, it becomes necessary to understand how collective health is conditioned by the relation of man to man and by the laws of human association, which is the domain of tomorrow's sociology.

The whole process was well illustrated in the life and work of Dr. Stephen Smith, first president of the American Public Health Association. When, before the 1860's, Dr. Smith practised at Bellevue Hospital in the serious epidemic of typhus fever in New York, he traced to one lodging house a number of serious cases. Seeking to eliminate this center of infection, he sought out the responsible owner, and found him in his home on Union Square. But the lodging house, said the owner, had never "paid." It was a nuisance to him. Vacant, it had been occupied as free lodgings by recently arrived immigrants. The owner would do nothing. The city government had no power. From this experience came Dr. Smith's

motivation to work in the Civic Association and to bring about a sanitary survey of New York City. This survey led to the municipal health law, which was the forerunner of similar legislation in other cities. Recognizing the need for public education, Dr. Smith took a leading part in the establishment of the American Public Health Association to promote this legislation and to improve its administration.

Thus in his own work Dr. Smith set a pattern in which we discern the stages of all sound social action: (1) experience, (2) vision and a social conscience to motivate the individual in the arduous task of social change, (3) research, which is formulated experience, (4) experimentation, or demonstration, which is closely allied with research, and (5) generalization, which makes experimentation community-wide and available to all. In the first four steps the support of an enlightened few can always be won. In the last, the task of generalization, usually requiring action by government, we come into the area of conflicting interests. Dr. Smith's knowledge of the origin of typhus fever and of the means of treating and of preventing it could not be fully applied until he confronted the problems presented in the field of economics, where ownership is not yet made responsible for the welfare of the community; and in the field of political science, where

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steps have to be taken to secure public support, to convince legislators, and to insure effective administration of a new law.

The social gains of the last ten years, which constitute the subject of this paper, may be looked for in this area of generalization. Here also we find the conflicts which have checked these gains or even to some extent nullified them. Here, again, we find the unfinished tasks of the future.

In this past decade the notable advance in social welfare has been the recognition of governmental responsibility on a national scale for meeting individual needs and for establishing new standards. Out of the profound and widespread suffering of unemployment came at last in our country the assumption by the federal government of the burden of relief, together with measures of social security directed toward meeting individual needs. In a different category the federal legislation of the past decade has included attention to the organization of productive forces, rather than their mere regulation. The Tennessee Valley Authority and the Rural Electrification Administration are typical of action in this field. Finally, another type of social gain has been made in the establishment of the right of collective action in industrial relations. The legislation which has established the right of workers to bargain collectively has far-reaching implications for the public health movement. Enforcement of standards in living and working conditions requires the day-to-day experience and watchfulness which can be developed in the trade union through joint action between management and workers.

Thus the social gains of the past ten years may be summed up as twofold: a new concept of government, or, perhaps better, the practice of an old concept embodied in the constitutional obligation of the federal government to

promote the general welfare; and new possibilities of workers' action for health and safety.

Where, then, are the setbacks? They are illustrated in the public health movement. In the hopeful days when the new program of this decade was being planned in the federal government, one of your leaders declared that in public health we were moving from experimentation to action. Looking back, we have to say that the movement has been slower than he apparently anticipated. The circumstances are too well known to public health workers to need detailed analysis. The Committee on Economic Security appointed by the President was charged with the duty of making recommendations regarding health insurance. A careful study was made and a program developed; but, apparently, conflicting interests came into play, with the result that, when the committee's report was finally transmitted to Congress, it contained no mention of health insurance.

Thereafter came the National Health Conference, with the findings before it of the National Health Survey, showing that between 40 and 50 million individuals lived in families in the United States having an annual income so low as to have no reserves for the economic hazards of sickness. Moreover, at the time of the survey, in the 2,500 rural counties only 946 health officers were serving full time, and only 770 institutions had any true outpatient departments. The recommendation for a modest yet fairly adequate appropriation by the federal government, which was made by the National Health Conference, was placed before Congress, but never enacted. Even the President's final program for a limited number of hospitals has received no attention. The American Public Health Association has played its part in seeking to promote health insurance and extension of medical service, but other organized groups in

the medical profession have vigorously opposed this generalization of health.

The same checks to progress through opposing interests are illustrated in housing. In January, 1934, the New York Legislature passed a law which recounted in its preamble the conditions and the remedy for them. The preamble called attention to the effects on community health and welfare of congested and crowded living conditions. At the same time the statement was made that proper housing for the numerous families in low-income groups could not be provided by private enterprise. This need had to be met by government. Despite this legislative assertion, and despite legislation by the federal government and by the states, many communities today lack proper housing, even in areas where production for national defense goes forward under governmental control.

The great fact to be faced in a consideration of what is happening to social gains is today's war. Shall it be classified as a setback, an interruption, or a profound experience of the human race, challenging new examination of the basis of social welfare, and a rallying of forces for the constructive work of peace? It should indeed be a source of discouragement if public health workers have learned to prevent epidemics of typhus fever and cholera from crossing national boundaries, only to find their efforts to prolong life defeated by destruction of life on the battlefield, through bombing of populations, sinking of ships, and starvation of peoples through economic blockades. War is the great offense against public health.

Whatever the conclusion regarding the causes and significance of war, we are forced today to a new concentration upon industry and industrial relations as basic in understanding the social gains and the social losses of the recent past. The experience of unemployment, which we have noted as giving rise to

"the new social welfare," as it is called in the title of this session, was an industrial phenomenon. Action by the federal government has related to workers, employed and unemployed, and in general to economic trends and industrial standards.

The vital importance of industry to the public health has been recognized by this Association. On your fiftieth anniversary Dr. George Martin Kober analyzed the history of industrial hygiene. He quoted a historian of industry who declared, in effect, that industry indicated the progress of the human intelligence, and that industrial history marks stages in the evolution of mind; "the intelligence of a race is measured by its industry, and . . . the primary *raison d'être* of industry is safety and health." Such a concept takes on new significance in the profound changes wrought by technology in methods of production today. It calls for study and action along broad lines.

The new technology has brought new hazards to health and safety. The bituminous coal mines are an illustration. The year 1940 had the worst record in number of fatalities from major disasters since 1928. The reports of experts clearly reveal that the explosions causing these deaths were directly traceable to failure to take the precautions long established but now neglected because rapid mechanization has created the temptation to introduce two and three shifts and to increase speed. On October 1, the new federal mine-inspection law took effect. It gives new powers, though still quite inadequate, to the Bureau of Mines. It provides for an advisory committee composed of operators and miners. This committee will be reinforced by the new provision for joint safety committees contained in the Appalachian agreement of 1941 between the operators and the United Mine Workers. The men who work see dangers and can prevent them if they

participate in safety committees. This pattern of action reinforced by legislation now being initiated in the mining industry is applicable to other industries.

The experience of a decade may be summed up by saying that the public health movement is clearly conditioned by the progress of social welfare, and also that public health workers are needed to play an important rôle in social progress. This function may be described as the setting of standards. The word is familiar to this Association, since one of its characteristic methods has been the study of standards to be established in various phases of living and working conditions. Attention is now needed to the whole broad subject of standards of living, with standards of working conditions regarded as a branch. Out of the scientific work related to health should come precise definitions of what is adequate in food, clothing, and shelter, and what is possible in providing safe and healthful conditions of work. Science has given the basis for these standards. What is needed is their generalization.

Such a task is not limited to one nation. At this gathering are distinguished foreign guests, notably from other countries of the Western Hemisphere. In areas of production of raw materials in many of the countries of

Latin America the need is great for establishment of standards of working and living conditions. Public health workers in the United States have an obligation to these countries, since ownership and management of their industries are vested in large part in the United States.

An international view of public health and its industrial basis will be needed in the terms of peace. Indeed, public health workers should not underestimate the potential significance of their work at the peace table. Recognition and establishment of proper living standards for all peoples of the world should be demanded of all governments whose representatives will have responsibility and power for working out the new basis of international relations. The applicability is clear for such a program of public health in countries which have had a more or less defined colonial status or at least have been subject to absentee ownership of their natural resources, such as India, China, Africa, and the Near East, not to mention our neighbors in Latin America.

Technology has vastly increased man's power to control his environment. The will to control it and to give the benefits of the new science to all people waits upon a new vision of man's relation to man.

Recent Studies in Influenza*

FRANK L. HORSFALL, JR., M.D.

Hospital of The Rockefeller Institute for Medical Research, New York, N. Y.

WITHIN the past year a number of significant advances have been made as a result of laboratory investigations of epidemics of influenza. A second etiological agent has been discovered. Indirect evidence has been obtained that at least a third causal agent exists. Two new diagnostic technics have been described. In the case of influenza A it has been found that artificially increased antibody levels are associated with decreased susceptibility to the disease.

The possibility that the etiology of influenza was varied has been recognized for some time. Within two years of the discovery of the first influenza virus by Smith, Andrewes, and Laidlaw¹ these investigators recognized that clinical influenza was probably not a single etiological entity.² Two years later Francis³ showed that an epidemic of influenza could occur in the absence of demonstrable infection by the virus of the British workers. Additional epidemics of influenza which occurred in 1940 in England⁴ and this country^{5, 6} were also found not to have been associated with what is now termed influenza A virus.⁷ As is well known, numerous workers in various parts of the world showed during the period 1935-1940 that in many epidemics influenza A virus had been causally related to the disease. During the past year it was

clearly recognized by some investigators that, while certain epidemics of influenza were associated with infection by a known virus, others, although manifesting similar clinical and epidemiological characteristics, were not. This led naturally to the hypothesis that some other agent, probably a virus, might also be associated with this disease.

In 1940 Magill⁸ and Francis⁵ described independently two new strains of influenza virus. These strains were antigenically distinct from strains of influenza A virus; they were not neutralized by antisera against the latter agent and antisera against the new strains failed to neutralize influenza A virus. Furthermore, the patients from whom these new strains were obtained developed, during convalescence from influenza, increased levels of neutralizing antibodies against the homologous strains but did not produce additional antibodies against influenza A virus.^{5, 9} Francis¹⁰ showed that the new virus could be differentiated from the first influenza virus by means of the complement-fixation test. It has been found recently¹¹ that these two new strains possess common antigenic components, that is, antisera against either strain will neutralize the other. Both these strains have been found to fulfil all of the criteria necessary for their classification as influenza B virus⁷ and are now usually so designated. A number of additional strains of influenza B virus were recovered from patients with clinical influenza during the past year.⁶ All

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of these strains were neutralized by antisera against other strains of influenza B virus; none were neutralized by antisera against influenza A virus. The patients from whom these strains were recovered produced additional antibodies against influenza B virus during convalescence; with but one exception, none of these patients developed increased antibody levels against influenza A virus. Not only did influenza B occur during the winter of 1940,^{5, 6, 9} but Francis¹⁰ has shown that a number of cases in the 1936 epidemic in California were undoubtedly of this variety. Furthermore, Andrewes¹² has recently obtained evidence which indicates that influenza B was present in England during 1940.

These studies seemed to indicate clearly that clinical influenza may be associated with infection by two distinct and antigenically different agents—*influenza A virus* and *influenza B virus*. But it now seems likely that additional infectious agents, possibly still other influenza viruses, associated with the etiology of this disease remain to be discovered. The evidence for this hypothesis is indirect and was obtained during an extensive etiological investigation carried out on more than 1,300 cases of clinical influenza.⁶ These cases occurred during three distinct epidemic periods in this longitude between January, 1940, and February, 1941. By means of appropriate tests on both acute phase and convalescent sera an attempt was made to establish the nature of the infecting agent in each case. In the majority of instances it was possible to demonstrate that a significant increase in antibodies against one or the other of the two known influenza viruses had occurred during convalescence. In some instances antibodies against influenza B virus were produced, in others antibodies against influenza A virus developed and in only 7 cases, or 0.5 per cent, were increased antibody levels

against both viruses demonstrated. However, in 388 cases, or 30.5 per cent, antibodies were not produced against either virus. Throat washings obtained from representative cases in this latter group, although they sometimes caused suggestive signs of infection after the inoculation of ferrets, were found not to contain either influenza A virus or influenza B virus. It seemed probable therefore that at least a third distinct infectious agent might be associated with clinical influenza. So far efforts to recover and identify this hypothetical agent have been unsuccessful.

At the present time it is possible to distinguish between at least three apparently different varieties of clinical influenza. Unfortunately the symptoms, physical findings, and clinical courses of these three varieties seem so similar as to be almost indistinguishable. It may be that future investigations will reveal differences, but so far no distinguishing clinical characteristics have been noted. Laboratory tests will however differentiate one kind of influenza from another. The present subdivisions of the syndrome may tentatively be defined as follows: *influenza A*, an acute febrile disease in which influenza A virus can often be recovered from the nasopharynx during the first few days of illness and an antibody response against this agent can be demonstrated regularly during convalescence; *influenza B*, an acute febrile disease in which influenza B virus can often be obtained from the nasopharynx during the acute stage and increased antibody levels can be demonstrated regularly against this agent during convalescence; *influenza "Y,"* or influenza of unknown cause, an acute febrile disease in which neither influenza A nor B viruses can be found in the nasopharynx and no increase in antibody levels against either virus can be demonstrated during convalescence. It seems logical to think that this latter subdivision may repre-

sent a group of specific etiological entities.

It is well known that clinical influenza tends to occur in epidemics and that in this latitude the epidemics usually occur during the winter months. By analogy from other well defined epidemic diseases it might be thought that all or almost all cases in a single epidemic of influenza would be of one etiological variety. There is now considerable evidence^{4, 13, 6} to indicate that this is not the case. During the course of the extensive investigation of the etiology of influenza⁶ referred to previously, it was found that at least three varieties of influenza could occur at the same time in a single epidemic. Even in outbreaks among the inmates of individual institutions, evidence was obtained that some patients had influenza A, others influenza B, and still others influenza "Y." These unexpected results indicated that an epidemic of influenza may be of diverse etiology and led to the hypothesis that any individual case of influenza may be associated with infection by one of at least three different agents.

On this basis it seems evident that the demonstration that a few selected cases in a given epidemic were infected with influenza A virus, or influenza B virus, can hardly be taken to indicate that the whole, or even the major part of the epidemic was either influenza A or influenza B. Similarly the failure to obtain evidence that any case in a small sample was either influenza A or B should not necessarily lead to the conclusion that these varieties were not present in the epidemic.

Until very recently the virus neutralization test and the complement-fixation test were the only methods known to be useful in measuring antibodies against influenza viruses. In 1941, two new *in vitro* technics were described. Goodner¹⁴ developed a technic termed "collodion fixation" by means of which either virus or antibody could be detected

with great delicacy. Hirst¹⁵ discovered that the allantoic fluid of chick embryos infected with either influenza A or B virus was capable of agglutinating red blood cells. He also found that this phenomenon could be used to measure the relative quantity of either virus or antibody. This technic will probably become very useful, since it is simple, rapid, and appears to be equally as specific as the laborious neutralization test.

Immunity to influenza is an important problem and a difficult one. It is well known that individuals may contract the clinical disease repeatedly. However, since the syndrome embraces two known distinct etiological entities and almost certainly includes at least one more, it may be that repeated attacks are associated with infection by different agents. There is evidence that this may be true. Magill¹⁶ has presented data to show that one individual had influenza A in 1939 and influenza B in 1940; while another individual had influenza A in 1937, influenza due to neither A nor B virus in 1939, and influenza B in 1940. Furthermore, in an observation area where some 1,200 persons have been carefully followed since 1937, there was a small epidemic of influenza A in 1939.¹³ At that time 59 persons contracted the disease, and 63 others developed subclinical infections by influenza A virus. In 1941, 23 cases of influenza A occurred in this same population, but none of the 122 persons infected 2 years previously contracted the disease.

It is seldom possible to determine whether a given individual is immune or susceptible to one or another variety of influenza by direct test. However, in instances in which volunteers were given influenza A virus intranasally, only those individuals developed a manifest infection who had low levels of antibodies against this agent.^{17, 18} Whether experimentally induced influenza A in human beings is entirely analogous to

the naturally occurring epidemic disease may be open to some question. Therefore, efforts have been made to determine whether there was any relationship between the various antibody levels found in normal individuals and the occurrence of the natural disease.

It has been known for some time that different individuals possessed different amounts of antibody against influenza A virus,^{2, 19} and recently the distribution of antibody levels in a normal population has been studied.^{13, 20} This was done under carefully standardized conditions with sera obtained from over 1,300 apparently normal persons residing in areas in which epidemics of influenza had not occurred for at least 2 years.²⁰ Then, in 310 individuals who contracted proven influenza A, a study was made of the serum antibody levels, either prior to the onset of the disease or in the first days of the illness before additional antibodies were produced.

The results showed that considerably more cases of influenza A occurred in persons with low antibody levels against this virus than were to be expected. This indicated that persons with low levels of antibodies against this virus were relatively susceptible to influenza A. Conversely, many fewer cases of the disease occurred in persons with high antibody levels than would have been anticipated. This indicated that individuals with high antibody levels were relatively resistant to influenza A. It is of importance to point out that no critical antibody level was found which assured complete immunity against the disease and that a few individuals in even the highest antibody range were found to have contracted influenza A.

The finding that there was a definite correlation between high antibody levels against influenza A virus and relative resistance to the disease itself suggested that additional attempts at prophylactic immunization against influenza A might be made. It seemed probable that if it

were possible to increase antibodies against this virus to sufficiently high levels in a given population, the incidence of influenza A in an epidemic might be reduced.

It was shown previously²¹ that a "complex vaccine" containing influenza A virus stimulated the production of more antibodies against this agent than other vaccines tested in human beings. Efforts were made to determine whether this vaccine would actually produce a significant degree of immunity against the natural disease itself.

Large groups of persons in various institutions in different parts of the United States were given a single subcutaneous injection of the complex vaccine during 1940. Somewhat larger groups in the same institutions were left as unvaccinated controls. Three reports on results obtained in field tests with this vaccine have already appeared. Dalldorf and his coworkers²² investigated one institutional outbreak of influenza which occurred 1½ months after vaccination. A total of 77 clinical cases occurred and serological tests were made on 59 cases. Approximately three-fourths of the cases studied were found to have had influenza A. A slight reduction in the incidence of the clinical disease was observed in the vaccinated group but, because of the small number of cases, this seemed of doubtful significance.

Martin and Eaton²³ investigated two institutional epidemics which commenced a few days after vaccination. A total of 806 clinical cases occurred, but serological tests were carried out on only 76 cases. It was found that approximately three-fourths of the cases tested had influenza A. On the basis of this evidence it was considered that all of the clinical cases probably had influenza A. In one institution a significant reduction in the incidence of clinical influenza among vaccinated individuals was observed. In the other

institution there was no significant difference between the incidence of the illness in the vaccinated and control groups.

In another report²⁴ the results obtained in 10 separate institutional epidemics which occurred 4 months after vaccination were analyzed. The increase in antibodies against influenza A virus which followed the administration of each lot of vaccine was determined 2 weeks and 4 months after vaccination in a considerable number of individuals. Consequently the specific antigenic potency of each lot of vaccine could be assessed. A total of 1,450 cases of clinical influenza occurred, and serological tests were carried out to determine the nature of the virus infection on 967 cases, or 66 per cent of the total. It was found that, in the 4 institutions in which vaccine of relatively poor specific antigenic potency had been used, the incidence of influenza A among vaccinated individuals was only 19 per cent lower than among control individuals. However, in the 6 institutions in which vaccine of relatively good specific antigenic potency had been used, the incidence of influenza A among vaccinated individuals was 50 per cent lower than among control individuals. It is of importance to point out that the incidence of influenza of unknown cause, or influenza "Y," was not significantly different in the two groups, although almost 30 per cent of the total number of clinical cases were of this variety.

The significance of these results does not arise from the observation that the incidence of influenza A was lower in the vaccinated than in the control groups. Rather it lies in the demonstration that an artificially produced increase in antibodies against influenza A virus was associated with a decreased susceptibility to influenza A. It appears that the antibody levels which are developed following vaccination with this virus contribute to a state of relative

resistance to influenza A to an extent approximately equal to, but no greater than, corresponding antibody levels possessed by normal individuals.

It might be thought that, by means of the administration of influenza A virus vaccines of much greater antigenic potency, considerably higher antibody levels could be achieved and then that a corresponding increase in resistance to this disease would be acquired. It is probable that to some extent this can be accomplished but it seems very improbable that the parenteral administration of influenza A virus in human beings will result in the regular production of those excessively high antibody levels which appear to be correlated with a degree of resistance approaching actual immunity to this disease.

At the present time but little is known regarding resistance to influenza B. However, there is evidence²⁰ that the level of neutralizing antibodies against influenza B virus may be one factor in determining susceptibility or resistance to it, in a manner analogous to that of antibodies against influenza A virus in the case of influenza A.

There is also evidence²⁰ that the level of antibodies against influenza A virus has no relation to susceptibility to influenza B, and vice versa. Since it is known that influenza A and B viruses do not possess demonstrable common antigenic components, this lack of heterologous relationship was to be expected.

It is obviously impossible to make any comments upon factors which may be of importance in determining resistance to influenza "Y," since so far the infectious agent or agents associated with this illness have not been discovered.

It should be apparent that the etiology of clinical influenza is still an important problem and that much remains to be learned regarding the nature and characteristics of the causal factors

responsible for this group of clinically similar illnesses.

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Diagnosis of Epidemic Encephalitis by Complement-fixation Tests*

J. CASALS, M.D.

Rockefeller Institute for Medical Research, New York, N. Y.

IN previous publications¹ we have described how the complement-fixation test could be used extensively in the study of central nervous system virus infections. Antigens having no anticomplementary power can easily be prepared from infected mouse brain tissue, and by inactivation of the sera at the proper temperature, specific reactions are obtained.

Recently we have had the opportunity to apply this test on a large scale for diagnostic purposes in a severe outbreak of epidemic encephalitis in man.

Starting early in August and lasting through the middle of September, there took place, in several mountain and north central states as well as in some Canadian provinces, especially Manitoba, a serious outbreak of encephalitis which occurred simultaneously with an epidemic of poliomyelitis, making the clinical diagnosis very confusing.

Samples of blood serum were obtained from Manitoba and Colorado.† Seventy-four sera from Manitoba and

9 from Colorado were tested for complement-fixing antibodies in an attempt to establish a diagnosis. Each serum was tested simultaneously against the antigens of EEE, WEE, LCM,† and St. Louis encephalitis. In every instance the reaction with the EEE, LCM, and St. Louis encephalitis has been negative, whereas from the beginning it was well apparent that the number of sera reacting with the WEE antigen was very large.

The sera were inactivated at 60° C. for 20 minutes, except in a few instances when a temperature of inactivation of 65° C. was used; each serum was tested in twofold dilutions through 1:16, starting with either undiluted serum or serum in dilution 1:2.

A sample titration is given in Table 1. Of a total of 83 sera 44, 53 per cent, gave a positive reaction with the WEE antigen, and 39 were negative. The titers of the positive sera as determined by the highest dilution giving a 2 plus or better reaction were: 1:2 in 4 cases; 1:4 in 6 cases; 1:8 in 7 cases; and 1:16 or better in 27 cases.

The proportion of sera, 53 per cent, reacting with WEE antigen, was high, yet perhaps not sufficient in itself to give more than presumptive evidence as to the etiology of the infection. But there are two very interesting observations that render the diagnosis almost certain: (1) the proportion of positive

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† EEE—Eastern equine encephalomyelitis; WEE—Western equine encephalomyelitis; LCM—lymphocytic choriomeningitis.

‡ The blood sera from patients were kindly supplied by the following persons: Dr. Daniel Nicholson, Dr. J. D. Adamson, and Dr. Bruce Chown, all of Winnipeg, Canada; Captain C. E. G. Gould and Lieutenant S. Young, of Manitoba, Canada, and Dr. Joseph E. Smadel, of New York. To all we express our gratitude.

TABLE 1
COMPLEMENT-FIXATION TEST
Human Sera Inactivated at 60° C. for 20 Minutes
Mouse Brain Antigens

Sera	Antigen																			
	Western Equine Encephalomyelitis					Eastern Equine Encephalomyelitis					Lymphocytic Choriomeningitis					St. Louis Encephalitis				
	Dilution of Serum					Dilution of Serum					Dilution of Serum					Dilution of Serum				
No.	1:1	1:2	1:4	1:8	1:16	1:1	1:2	1:4	1:8	1:16	1:1	1:2	1:4	1:8	1:16	1:1	1:2	1:4	1:8	1:16
118	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	4	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	4	4	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
146	4	4	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4 = No hemolysis
0 = Complete hemolysis
2, 3 = Intermediate degrees of hemolysis

sera in connection with the time elapsed since onset of the disease, and (2) the results obtained with sera from patients from which two samples of blood have been obtained at different periods following onset.

Table 2 gives the number of sera reacting with the WEE antigen in relation to the number of days elapsed between onset and bleeding for the complement-fixation test.

The results as summarized in Table 2 give strong evidence that the WEE virus was the one responsible for the epidemic outbreak, since of those patients bled 10 days or less after onset, only 2 of 25, 8 per cent, had antibodies, whereas of the patients bled 11 or more days after onset, 42 of 58, 72.5 per cent, were positive.

In 7 cases blood was obtained from

the same patient at two different dates following onset; the result of these tests is given in Table 3.

In 4 cases a reaction which was negative in the early days of illness became strongly positive later on in the disease or convalescence, and in a 5th case a titer of 1:8 on the 9th day rose to higher than 1:16 on the 24th day.

This evidence in connection with that given in Table 2 clearly establishes the etiology of the epidemic beyond reasonable doubt.

We may add in passing that from 1 fatal case from Winnipeg a virus was obtained which on neutralization and cross-protection tests behaved like known strains of WEE virus.

In this epidemic, by means of the complement-fixation test, a diagnosis was obtained earlier than by any other

TABLE 2

Interval between Onset of Disease and Bleeding for Complement-fixation Test	Days	Number of Sera	Reaction with Western Equine Encephalomyelitis Antigen	
			Total Positive	Per cent Positive
0 to 5	5	9	0	0
6 to 10	10	16	2	12.5
11 to 15	15	26	16	61.5
16 to 35	35	32	26	81.3

TABLE 3

Patient	First Bleeding for Complement-Fixation Test		Second Bleeding for Complement-Fixation Test	
	Number of Days from Onset	Reaction with Western Equine Encephalomyelitis Antigen	Number of Days from Onset	Reaction with Western Equine Encephalomyelitis Antigen
W. # 150	10	Negative	31	Positive — 1:16
Ha. # 124	7	Negative	30	Negative
Hu. # 123	6	Negative	29	Negative
Be. # 154	10	Negative	25	Positive — 1:16+
K. # 155	9	Positive — 1:8	24	Positive — 1:16+
Bl. # 127	6	Negative	17	Positive — 1:16+
Br. # 146	2	Negative	22	Positive — 1:32+

method; for this reason and also because of the possibility of making observations on a much greater number of specimens, we believe that the complement-fixation reaction is more practical than the neutralization test.

In concluding, we would like to give a description of the test as it is run in a simplified form.

The antigen is a suspension of infected mouse brain in 10 times its weight of saline. This emulsion is kept in the icebox 20 hours, then it is centrifuged at 2,500 r.p.m. for 30 minutes; the supernatant is frozen and thawed 5 times in a dry ice-alcohol mixture and then centrifuged in the Swedish angle head centrifuge at 3,500 r.p.m. for 1 hour; the supernatant, after the addition of merthiolate in dilution 1:10,000, is the antigen. These antigens are virulent and precaution should therefore be observed in handling them. We know that avirulent antigens can be prepared using ultra-violet light as the inactivating agent. Rabies and EEE virus antigens have thus far been tested with satisfactory results. The sera are inactivated at 60° C. for 20 minutes, undiluted or in dilution 1:2.

The test is run as follows: the complement is titered as for the Wassermann reaction; two units are used in the test. Then come the successive steps of the reaction:

1. Twofold dilutions, from 1:1 or 1:2 through 1:16, of the inactivated serum are put in as many series of tubes as antigens are available; the volume of the serum dilutions is 0.25 ml.

2. 0.25 ml. of a given antigen is added to each tube in the series. In our tests at least 4 different antigens have been used each time, namely WEE, EEE, LCM, and St. Louis encephalitis.

3. An extra tube is set aside for each antigen, as control of the anticomplementary power of the antigen; this tube contains 0.25 ml. of antigen and 0.25 ml. of saline, the latter to substitute for the serum.

4. Two units of complement, as determined by the previous titration, are added to each tube in a volume of 0.5 ml.

Now the tubes containing the dilutions of serum, the antigen, and the complement all in a volume of 1 ml., as well as the tubes containing the antigen and the complement but *no* serum also in a volume of 1 ml. (since 0.25 ml. of saline substitutes for the same volume of serum), are placed in the icebox for 18 hours. Following this incubation the tubes are kept at room temperature for ½ hour, and the hemolytic system is then added, consisting of 0.25 ml. of a 3 per cent suspension of packed sheep blood cells and 3 hemolytic doses of antisheep hemolysin also in 0.25 ml. The total volume of fluid in each tube is now 1.5 ml. The tubes are incubated in a water bath at 37° C. for ½ hour and the reaction is read.

We believe that this simplified reaction can substitute for the more elaborate one described by Dr. Palacios and myself some time ago,² and that the efficacy of the complement-fixation test in the diagnosis of certain central nervous system virus infections is well exemplified by the results here reported.

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Sanitary Engineering Activities of the Sanitary Corps, United States Army*

W. A. HARDENBERGH

*Colonel, Sanitary Corps, U. S. Army, Chief, Subdivision of Sanitary Engineering,
Division of Preventive Medicine, Office of The Surgeon General, Washington, D. C.*

THE Sanitary Corps is one of the components of the Medical Department of the Army. Its function is to provide technical advice and assistance to the Medical Department in the application of the principles of military sanitation for the prevention or control of disease and the conservation of the health of the troops. In performing these duties, the same basic principles are employed as in civilian health work though the methods of application may, of necessity, differ, due to the military situation and to Army organization and procedure. The services of a variety of specialists are required and the Sanitary Corps includes not only sanitary engineers but also chemists, bacteriologists, entomologists, and other non-medical public health specialists. However, in this discussion, special attention will be given to sanitary engineering activities.

ORGANIZATION AND DUTIES

Sanitary engineering is organized as a subdivision of the Division of Preventive Medicine in the Office of The Surgeon General. Similar organizations on a smaller scale are provided in the offices of the Corps Area Surgeons and

in some of the Overseas departments. Sanitary engineers are stationed at all of the important camps and cantonments and at some of our new bases. General needs and policies are determined in the Office of the Surgeon General and instructions are issued through the Corps Areas and the departments, outlining the procedures to be carried out. Details are the responsibility of the men in the field since, being on the ground, they are better able to evaluate local needs and determine the procedures most suitable to meet them.

Sanitary engineers may be called upon to investigate, report on and make recommendations relative to the sources of water supply, the methods of water purification, the treatment of sewage, the disposal of waste, the control of mosquitoes or other carriers of disease, and the location of camps. Their duties consist mainly of inspection and advice; other Arms and Services furnish the labor, funds, and equipment, and perform the required work. The duties that Sanitary Corps officers may perform, and their relations with other Arms and Services may be outlined briefly as follows.

WATER SUPPLY

The provision of water to camps, posts, and stations in the United States is a function of the Quartermaster

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Corps. However, since the Medical Department is charged with the responsibility for factors that may affect health, it must concern itself with all of the steps in the procurement and treatment of water, including the selection of the source, the sufficiency and quality of the supply, the type of treatment, and operating procedures. The Corps of Engineers is charged with providing water in the field but the Medical Department is again responsible for factors affecting health and for supervision of both procurement and treatment.

Of the new camps, 11 are served by modern filtration plants; the others obtain water from wells or from adjacent municipal plants. The available quantity or quality of water is often a determining factor in the selection of sites for large camps, since the provision of 3.5 to 5 m.g.d. is not a simple problem, due to the pollution of surface sources, lack of reservoir sites, or absence of available ground water. When a camp is located near a city, it may be assumed that the population of that city will increase by one-half the number of troops in the camp. The resulting increase in water consumption is often a burden upon the municipal system.

Records from a number of camps indicate an average water consumption of slightly more than 100 gallons per man per day, with individual camps varying from 65 to 136 gallons.

SEWERAGE

The Quartermaster Corps is charged with the design, construction, and operation of sewage treatment plants for camps and cantonments. Since improper design or operation may affect health, the responsibility and scope of the duties of the Medical Department are broad, and frequently involve both the bases of design and the types of construction.

Of 45 major Army camps, 3 use adjacent municipal sewerage systems for disposal; one has an Imhoff tank instal-

lation; 1 uses sand filters; 9 provide primary treatment and separate sludge digestion; 7 have standard trickling filter plants; 5 use activated sludge plants; and 19, high-capacity filters. Sewage flows, as reported by a number of camps, average 98 gallons per man per day. The biochemical oxygen demand of the sewage ranges from 106 to 355, averaging 253 p.p.m. Suspended solids vary from 138 to 300 and average 213 p.p.m. The characteristics of camp sewage appear to be about the same as the sewage from the average municipality, though the grease content may be greater. Investigations are now being made regarding this.

MOSQUITO CONTROL

In applying the measures for the control of mosquitoes, many interesting and difficult problems are encountered. At Camp Davis where, in addition to salt marsh problems, there are large swamp areas to be drained, four draglines were employed to cut main ditches. At Camp Stewart, Ga., large dragline ditching was also needed. In the three camps near Alexandria, La., every type of work—ditching, oiling and larvicides—was necessary to maintain control. In addition to the natural sources of mosquito production, borrow pits, resulting from construction have been troublesome at numerous camps. Water standing under buildings has been an annoying source of production. In many camps, grading operations left low places under buildings which held water indefinitely. In one camp, 1,500 buildings required attention, and in other camps the situation was nearly as serious. Most of the camp buildings are supported on posts or piers and in some camps the fill around these posts settled so that around each support there developed a miniature mosquito producing area. Drainage and filling to remedy these conditions required a large force of men and a considerable

period of time, during which control was maintained by oiling.

Various types of larvicides have been used in order to test their efficiency by large scale work in the field. Pyrethrum and phenol larvicides have been satisfactory but most of the men in the field are more familiar with oil and appear to prefer it. While the kind of oil depends to some extent upon local availability, a No. 2 Diesel oil is most commonly used. The smaller fruit sprayers are preferred to the knapsack sprayer. More work with larvicides is planned for the 1942 season for their use reduces the size of the organization required to handle and supply oil and they are more effective in shallow areas containing heavy vegetation.

Experiments have been made on the large scale protection of outdoor gatherings, as at anti-aircraft emplacements. Results from these are promising but as yet inconclusive.

The large areas over which modern-day maneuvers are held, provide a complicated problem in mosquito control. At Camp Robinson, oil and Paris green were used, the work being started two or three weeks in advance of field exercises. A marked reduction in the prevalence of mosquitoes was noted. In the Tennessee maneuver areas, the U. S. Public Health Service and the State Department of Health oiled standing water throughout the area beginning about three weeks before the maneuvers were scheduled. Field commanders reported few mosquitoes in the treated areas. However, it is not believed that effective control can be economically carried on in the large areas covered by present maneuvers.

The result of the Army's mosquito control work is reflected in the materially lowered rates of malaria incidence in the United States. To September 1, the rate of admissions for malaria has been approximately two-thirds of the 10 year average (1931 to 1940), and

one-third of the 1918 rate. However, the maneuvers just ended have added a complicating factor, due to incomplete mosquito control in maneuver areas and the use of atabrin and quinine. Data are not yet available to indicate how the malarial rate will be affected, but a marked rise has been noted in the weekly rates for the first part of September.

In mosquito control, it is the responsibility of the Medical Department to determine the need for the work, to prepare the necessary plans, and to provide the technical supervision for carrying it out. Normally the Quartermaster Corps performs the actual labor. However, in order that the work would be started promptly last spring before mosquitoes began to emerge, the Medical Department in most camps organized its own crews and performed the work of ditching and oiling. The results obtained justified this departure from custom, but since mid-summer, this work has been, for the most part, turned back to the Quartermaster Corps with the Medical Department retaining supervision and technical direction.

SELECTION OF CAMP SITES

After a cantonment site is tentatively selected through field investigation, its advantages and disadvantages are reviewed in the office. Factors reported on by the Sanitary Corps include method and degree of sewage treatment and location of the treatment plant with reference to the surrounding community and to the camp area; the source of water supply and the treatment required, including a study of the probable surface and other pollution after the camp is established and satellite communities have grown up around it; the problems of malaria and mosquito control; the prevalence of other diseases, and the methods and cost of control; and efficiency of local and state health departments.

OTHER DUTIES

In an organization the size of the United States Army, problems involving sanitary engineering arise constantly. Therefore, an important part of the work of the Subdivision of Sanitary Engineering is that of advice and consultation to The Surgeon General and his staff. This work has included sanitary engineering problems affecting our new bases, sanitary surveys, assignment and utilization of engineering, laboratory, and entomological personnel; planning and the allocation of funds for the control of insect and rodent disease carriers; provision of water supply to troops in the field; plans for water sup-

ply and waste disposal; and problems incident to present-day field operations.

The Sanitary Corps is wholly a reserve component of the Army, there being no regular officers commissioned in it. Thus, its organization and the performance of the duties described have of necessity proceeded side by side. What has been accomplished, however, would have been impossible of attainment without the understanding and coöperation of the officers of the Medical Department, especially Col. James S. Simmons, under whose direction the Sanitary Corps has had the fullest opportunity to organize efficiently and work effectively.

Two Years' Experience in a Nutrition Program for National Defense*

FREDERICK F. TISDALL, M.D., F.R.C.P.(C.)

Department of Paediatrics, University of Toronto, and Hospital for Sick Children, Toronto, Ontario

ALTHOUGH Canada has now been at war for more than two years, its food problems—in common with those of the United States—have hardly been affected by the war. This is due to the fact that there is an abundant production of practically all foods and that fortunately our country is not in the actual theatre of war. Therefore our nutritional problems during the past two years have been essentially those of a country at peace, with the exception of the specific problems concerning the feeding of the Armed Forces of Canada.

Has Canada a nutritional problem? Surveys conducted before the war in Great Britain indicated that between one-third and one-half of the population was not receiving a diet adequate for health. Similar surveys conducted in the United States indicate that approximately 45,000,000 people in the United States are inadequately fed today. Are the same conditions present in Canada? The answer is decidedly, yes.

CANADIAN DIETARY SURVEYS

During the past two years four dietary surveys have been made by the Canadian Council on Nutrition of the

Dominion Department of Pensions and National Health—at Halifax, Quebec, Toronto, and Edmonton. A preliminary report of these dietary surveys was published in May, 1941.¹ Individual records of the food consumed by the different members of the family were kept for 75 to 100 families at each city. Three of the surveys involved families in the low income class, the incomes ranging from \$500 to \$1,500 per annum. The survey in Toronto involved a middle income class, with family incomes ranging from \$1,500 to \$2,400 per annum. The results are enlightening.

On the whole the mothers and the teen-age children were the most poorly fed, followed by the younger children, the husband almost invariably being the best fed individual in the family. Really deplorable deficiencies in many of the food essentials were encountered in the majority of the individuals studied. At Halifax the most important findings were marked deficiencies in the intake of calcium by the children, and of the vitamins, especially thiamin, by the whole group. For instance, the calcium intake of the children was approximately only 50 per cent of the desired amount, while the average adult intake of thiamin was less than 200 I.U. per day, which is about one-third of the dietary requirements. In Quebec the calcium intake again was very low. The

* Read at a Joint Session of the American School Health Association and the Health Officers, Food and Nutrition, Maternal and Child Health, and Public Health Nursing Sections of the American Public Health Association, at its Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

teen-age children had the lowest intake, the boys in this group having an average intake of 49 per cent of the standard, and the girls 41 per cent. The women, teen-age girls, and the children under 11 years were not receiving sufficient iron, and the intake of thiamin was definitely inadequate. In Edmonton, no less than 20 per cent of the individuals studied got only a little more than half the food they needed. Forty per cent got three-quarters of their needs, and only about 40 per cent of the people studied were adequately fed. The most extreme deficiencies found in a large proportion of the individuals studied were calcium, iron, thiamin, and vitamin C.

Is this poor feeding due to financial difficulties and inability on the part of the people to procure the necessary food? A study of the foods purchased by the families in the lower income groups indicates that a marked dietary improvement could have been obtained in most instances by more intelligent expenditure of the available money. The results of the Toronto survey, which was on families having yearly incomes between \$1,500 and \$2,400, have a bearing on this. Although these people obviously had sufficient money to purchase a diet adequate for health, the study showed that there was widespread deficiency of thiamin, and the quantities of vitamin C could not be regarded as adequate. Marked deficiencies in the intake of calcium and iron were found with the women and of calcium with the teen-age girls. These studies show that there is an urgent need for nutritional education in Canada.

EDUCATIONAL PROGRAMS

What has been done in Canada in this regard? First, in spite of the tremendous government expenditures on the war effort, the greatly increased taxes on the middle and well-to-do classes, the greater calls that have been

made for war charities, and the drive to put every possible cent into war savings certificates—the nutritional educational efforts in Canada have been expanded rather than curtailed during the past two years. Just before the outbreak of war a booklet was prepared by the Canadian Medical Association and the Canadian Life Insurance Officers Association on *What to Eat to Be Healthy*. This little booklet in colors, of sixteen pages, outlines the fundamental principles of proper nutrition and indicates in a practical way how these nutritional requirements can be met. One and a quarter million copies of these booklets have been distributed, and a third edition of 125,000 copies is now in press.

Some 40,000 colored posters illustrating the fundamental principles of nutrition by means of attractive pictures of children at play were printed by the Canadian Medical Association, the Canadian Life Insurance Officers Association, and the Department of Education of the Province of Ontario. These were distributed in the schools of Ontario and have proved quite valuable in drawing to the attention of the children the importance of proper nutrition.

Shortly after the outbreak of war a booklet entitled *Food for Health in Peace and War* was prepared. This booklet tells the housewife how she can best spend her money to get optimum nutrition at the lowest cost. It was produced under the auspices of the Canadian Medical Association, with the assistance of the Canadian Life Insurance Companies in Canada and the Canadian Red Cross. One and three-quarter million of these have already been distributed and a second edition of three-quarters of a million, has just been printed. This makes in all two and a half million copies. The total number of homes in Canada is estimated to be just two and a half million.

The Federal Department of Pensions and National Health, through its Coun-

cil on Nutrition, the Canadian Public Health Association, the Canadian Red Cross, the Health League of Canada, the Canadian Dietetic Association, the Canadian Home Economics Association, and other national and local organizations are all taking an active interest in our national nutrition problems.

THE PROBLEM OF MINOR DIETARY DEFICIENCIES

From a national standpoint we are not interested in the obvious deficiency diseases. For instance, in the Hospital for Sick Children, Toronto, which hospital has approximately 100,000 attendance a year, we had 154 cases of rickets in 1925. Ten years later we had 4 cases. Children with scurvy number only six or seven a year. Frank pellagra and beriberi are unknown. Our problem today is not these obvious deficiency diseases, which are the end result of a marked deficiency—comparable in the tuberculosis problem to a patient dying of tuberculosis—but we are concerned with the minor dietary deficiencies which carried on over a period of months and years definitely affect the resistance against disease, vigor and efficiency of the individual. Recent work by Kruse² indicates that certain changes in the epithelial tissues of the conjunctiva are quite prevalent and that these changes can be cured by the administration of large amounts of vitamin A. When one realizes that this condition of the epithelial tissues of the eye may be simply a reflection of the condition of the epithelial tissues throughout the whole body, one can readily see the possible importance of this discovery from the standpoint of the general health of the body. Also, recent work³ has indicated that commonly encountered eye symptoms, such as photophobia, watering of the eyes, eye fatigue, and headache can be caused by a lack of riboflavin and respond readily to riboflavin therapy. The effect

of an insufficient amount of thiamin on both the physical and mental state of the individual has been clearly demonstrated.⁴ The deleterious effect of an inadequate supply of vitamin C on the healing of wounds has recently been emphasized.⁵ These are simply a few examples of how a diet which although adequate for average health may still not supply those food essentials necessary for the highest possible level of health and efficiency.

CURRENT RESEARCHES

Although the acquisition of our scientific knowledge of the nutritional requirements of the human body has far outrun its practical application, still there is need for further investigation. In fact no field of medical research has been so fruitful as this study of the nutritional requirements of the body. Recent work on the action of certain of the vitamins goes to the very foundation of our physiology.

Some nutritional studies being done in Canada are probably of interest to this group. Extensive work has been done by Dr. McHenry of the Connaught Laboratories of the University of Toronto showing the interrelationship of the various members of the vitamin B complex.⁶

A study has been made by Dr. T. G. H. Drake of the Hospital for Sick Children, Toronto, on the vitamin C supply of the Canadian people. Berries, melons, and some fresh vegetables, available in the summertime, supply considerable amounts of vitamin C. Unfortunately during the storage and processing of many of our fruits and vegetables common to both Canada and the United States, a large proportion of the vitamin C originally present is lost. During the winter months the lower income class depends almost exclusively on potatoes, cabbage, turnips, and tomatoes for its vitamin C. True, citrus fruits are widely available in Canada, but it is

questionable whether they are within the reach of many in the low income class. It is doubtful, therefore, whether any great number of our Canadian people are getting a diet adequate in vitamin C during the winter months.

Another study being undertaken at the present time is on the national supply of the vitamin B complex. A lack of the various members of the vitamin B complex is apparently quite widespread. How can this best be corrected? Wheat is an excellent source of many of the B vitamins. Yet, unfortunately, in the milling process five-sixths of the vitamin B₁ is removed and a large percentage of the other B vitamins. So here at once is a problem. How can wheat be milled so that it will retain the B vitamins in a much larger amount than is at present the case with white flour? This is the problem on which we have been working in conjunction with some of the millers and Dr. L. H. Newman, Chief of the Cereal Division of the Department of Agriculture at Ottawa. I am happy to say that we have succeeded in producing a white flour—not an 'off color' flour, but a white flour—which retains two-thirds of the vitamin B₁ originally present in the wheat, and an increased amount of other members of the B complex. To give you an idea of what this may mean—if this flour were used in place of the ordinary white flour in Canada, it would give the people of Canada during the course of one year many million dollars worth of the various members of the B complex at no additional cost. Steps are under way by the millers of Canada in conjunction with the Federal Department of Pensions and National Health and the Federal Department of Agriculture to put these findings into practical effect.

In conclusion, it is of interest to note that the military authorities in Canada are aware of the importance of applying modern knowledge on nutrition to the feeding of the Armed Forces. The Canadian Army, Navy, and Air Force rations have been devised to supply all the nutritional elements required in amounts adequate for health.

SUMMARY

Nutritional surveys conducted across Canada by the Canadian Council on Nutrition of the Department of Pensions and National Health indicate that a very considerable proportion of the Canadian population is not consuming a diet adequate for health.

While this condition may be due in some measure to low income, it is evident that lack of knowledge of the principles of nutrition is a most important factor.

Nutritional education work is being actively carried out in Canada. It is evident that there is widespread interest by the women of Canada in this problem of nutrition, and our efforts are falling on fertile soil.

Laboratory and clinical studies are being conducted which are shedding further light on our nutritional problem in Canada.

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Public Health Nursing in National Defense*

KATHARINE TUCKER, R.N., F.A.P.H.A.

*Department of Nursing Education, School of Education, University of
Pennsylvania, Philadelphia, Pa.*

IT is a truism that total war means total defense, since a whole population and all the resources of the country are involved. It is an obvious corollary that no individual, no profession, no agency can plan or act in isolation. In fact, only to the extent that planning and acting are interrelated and conceived of and carried through as part of the total scheme will national defense be accomplished as a whole or in any area of activity.

Inherently, public health nursing, along with all nursing and all other professions concerned with the health and welfare of human beings, is part of national defense in peace or war. Two years ago, or even a year ago, that was a relatively comfortable resting place, and it is still true that these peacetime services which save lives and build for health and happiness are an important part of national defense and thereby must be protected. But today it is also clear that we must be actively concerned with what is different: What part may public health nursing play in national defense with preparation for war as a central concentration point?

We have been told by leaders in the public health movement that the pub-

lic health nurse is a primary agent in health protection and health promotion. In October, 1937, Dr. Thomas Parran, in his paper entitled "Public Health Nursing Marches On," presented at the National Organization for Public Health Nursing Silver Jubilee Dinner, enumerated the major health problems of this country, with the recurrent refrain: "The public health nurse must bear the brunt of the battle." If that was true before the present need for acceleration of defense activities, it now is multiplied a hundredfold. It is therefore our responsibility to accept the obligations placed upon us by bringing to bear all of our past preparation and experience in analyzing how and when we can put public health nursing potentialities at the service of this extension of the health battle as it is affected by national defense.

NURSING IN DEFENSE AREAS

Let us review what definite action has already taken place immediately bringing public health nursing into the foreground. On March 1, 1941, the emergency health and sanitation bill (H. R. 3204) was passed, providing funds to supplement work in defense areas—in the extra-cantonment zones and areas around defense industries—this money to be administered under the U. S. Public Health Service. As far as

* Read before the Public Health Nursing Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

public health nursing was concerned, this meant the finding and placing of 65 qualified public health nurses; and, with the additional appropriation of July, the total number was brought to 115. In addition, 90 more are needed at once.

In the recruitment program first consideration was given to qualifications to be adopted under the merit system which would be in accordance with our present generally accepted standards. That this was accomplished is in itself a landmark and a guidepost. These qualified public health nurses were primarily sought from private agencies and from approved public health nursing programs of study. Obviously, it would have been defeating the purpose of the bill to take them from vital defense areas. Also in view of the effort of recent years under the Social Security Act to strengthen official health agencies in order to build up basic health protection within this country, they were not recruited from health departments. Again, thinking in terms of the long point of view, this has resulted in a distribution of public health nurses, the majority of whom have been connected with urban services, to rural areas wherein exists the greatest need. The splendid, generous, immediate response of agencies and nurses is a gratifying but not unexpected indication of awareness of the issues involved. Evidently this must be looked upon as only the first call!

Since for the most part these 115 nurses had had no previous experience in an official agency, to say nothing of working under the conditions involved in defense areas, the U. S. Public Health Service has wisely developed a one month orientation period in Washington for all the professional personnel to be employed under the emergency health bill. It is interesting to note that this group has included doctors, sanitarians, bacteriologists, and labo-

ratory technicians, as well as public health nurses, since the Public Health Service is selecting the type of personnel requested by state health departments as most urgently needed. The primary purpose of this period of one month is to give these professional groups a knowledge and understanding of the policies and procedures of the Public Health Service, particularly as these relate to their own professional activities. Also it includes a presentation and discussion of the relationship of this new group of health workers to the state and local health agencies and to other federal agencies that may be working in the territory. Emphasis has been laid on special health problems occurring in connection with migrating populations and defense industries, such as problems of sanitation, syphilis, gonorrhea, and industrial health.

After the orientation period for each group is over, the next step is their placement. Public health nurses are sent to any territory only on the request of the state health department. Since these requests exceed the available supply, the responsibility for relative quantitative distribution has to rest with the district staff of the Public Health Service in terms of the relative urgency of need. The state health departments, after assignment of the personnel to them, have provided two weeks' orientation so that these new workers can become acquainted with the specific policies and procedures of the state in which they are to work. The next step is the final assignment to the specific territory within the state. Again this has been the responsibility of the state health departments after they have had direct contact with the individuals. Thereafter, these workers have been under the administration and supervision of state health departments, the district staff of the Public Health Service acting only in an advisory capacity through the state departments.

FEDERAL FUNDS FOR NURSING EDUCATION

The most recent federal action was the passage on July 1 of legislation which included the appropriation of \$1,200,000 for nursing education. The effect of this on public health nursing has been both direct and indirect. It was the intention of the Act that the largest proportion of the moneys should go to increase the number of students in schools of nursing by enlarging their facilities. There can be no disagreement that this is the emergency need—more and better qualified nurses available for all types of professional service. Public health nursing represents one of the services that will greatly benefit thereby. Direct appropriations are also available for the more adequate preparation of public health nurses by increasing opportunities for student field experience in connection with approved public health nursing programs of study. At this time no report is available as to the allocation of these funds for public health nursing or the increase of students resulting.

Since the last World War there has been an accumulated emphasis on the qualitative and quantitative increase in public health nurses, an emphasis tremendously accelerated during the last emergency—the depression. Our hopes and our efforts in this direction assumed the proportions of reality through the Social Security Act. As we look back on the decades before 1935 we realize that in these last few years preparedness has been going on in the whole public health program, although it received its impetus from the actualities of a peacetime need. Through appropriations to state health departments, including approximately 4,220 stipends, the quantity, quality, and distribution of public health nursing personnel have been increased beyond anything experienced during pre-

vious years. Now, with the tying-in of these appropriations with merit systems, there is a substantial framework set-up for personnel and services which gives the soundest foundation as preparation for defense. One is tempted to be philosophical at this point. Certainly the time for health preparedness is in times of peace.

Let us look again at this question of quantitative increase in public health nursing. We can be thankful that there are approximately 22 per cent more public health nurses now at work than in 1931. However, it should give us pause that the latest figures just assembled for 1941 show a decrease in the number employed, for the first time in 4 years. This is slight, only 172, and there are various explanations for it as one breaks down the detailed figures. But the fact remains that at the very moment when it is most urgent that the trend should continue upward, it is tending in the other direction. Also there has been an appreciable decrease in the number of public health nursing students this year in the vast majority of university programs of study. To my mind, this constitutes a priority. We must organize our forces on every front so that there are constantly more, not less, public health nurses qualified and employed if we are to meet the present need and future emergencies in relation to national defense.

PROBLEMS DUE TO DEFENSE NEEDS

Certain phases of public health nursing content and service have a direct relationship to our effectiveness in national defense. It is possible here to give only a skeleton outline of the health problems that are accentuated by the war situation, without reviewing the whole gamut of public health nursing content—each part of which in the last analysis has to do with health protection and health promotion, and there-

fore ultimately with the lives and morale of the human beings who make this a country worth defending. Again, those in the public health and medical professions are fortunate in that their concern with these health problems antedates any specific question of war defense. Some of these problems have received special emphasis growing out of the depression and the advances in scientific knowledge. In still others the impetus has come from the material in the National Health Survey. This has brought us face to face with inescapable facts which have given a renewed vigor and determination to our attack.

Now we find nutrition, maternal and child health, the acute respiratory diseases, tuberculosis, the venereal diseases, and all other communicable diseases taking on new significance because of their definite relationship to national defense—in civilian life, in the life of enlisted men, and in the special health hazards of actual war. In each one of these health areas, whether through services in the home, clinic, health center, school, or industry—in the usual community situation, in disaster, or in defense territories—the public health nurse has a unique contribution to make in strengthening our national health defenses.

Other health problems that have been receiving more attention in the last few years must be put on our list in the light of preparedness. Under the leadership of the Children's Bureau and under Title V of the Social Security Act, we have been concerned with developing adequate preventive and treatment services for crippled children. It has been clear that public health nurses as individuals and as organizations have not been equipped to respond adequately. Now preparedness for what may come puts orthopedic services in the forefront of medical and nursing care that may be needed both within and outside of hospitals. Public health nursing, through

the Children's Bureau, the National Organization for Public Health Nursing, state departments of health, and local agencies, is mobilizing to fill this gap in our preparedness. Institutes, postgraduate courses, scholarships, and special orthopedic consultants are some of the forms by means of which this mobilization is taking shape.

THE INDUSTRIAL WORKER

Only within the last few years has the public health movement as a whole really incorporated industrial hygiene into its blueprint for an all-out health program. Again we find that the first steps for defense took place before the threat of war. But many more steps now need to be taken—and faster. The health and efficiency of any worker, whether in a defense industry or not, represents the strength or weakness of the nation, both because those who are employed are the vast majority of our adult population and because on them rests the economic structure of the country and the stability of the family.

In public health nursing when we talk of our part in industrial hygiene we think first of the nurse actually working in industry. She is in the first defense line in protecting the health of the industrial worker. Locally and nationally this is being recognized. The Public Health Service, through the assignment of one of its public health nursing consultants to its Division of Industrial Hygiene and the National Organization for Public Health Nursing by adding an industrial nurse consultant to its staff, are actively assisting in the extension of industrial nursing. Such services are crucial in defense industries to which the Public Health Service is giving special attention at this time. But both of these national bodies are also concerned with public health nursing services related to the health of *all* industrial workers. Universities conducting public health nursing programs

of study are being encouraged and helped to include courses for industrial nurses already employed, as preparation for those who wish to enter this field and as part of the basic preparation for all public health nurses. It is clear therefore that we already accept the fact that the nursing service within industry itself, whether a defense industry or not, is one of the spots where public health nursing is closely related to national defense. Our responsibility is equally clear—to assist in the development of such services through every available channel within our own sphere of influence and activity.

We are beginning to recognize more than that. The health of the worker cannot be protected or promoted merely within the walls of the establishment where he is employed. He is a member of a family, living in a house (we hope!) in a community. Where he lives, how he lives, with whom he lives, affects his health and well-being and therefore his work as he in turn affects the health and well-being of his total situation. In peace or war every public health nurse must become an industrial health worker in relation to the employed members of her families. She must know the industrial health hazards in their work environment, and what industrial health services are available to them. As part of her own service, she must be concerned with the way that the family, the home, and the community situations affect the health of the worker, and vice versa.

Furthermore community public health nursing agencies offer practically the only possibility of meeting the needs of small industries. Also they should so relate all their services to the medical and nursing programs organized within industry that they supplement each other without gaps and duplications. That is what all public health nurses must be prepared for and work for if those who are among our greatest

human, economic, and defense assets are to be kept well and efficient.

When we take a long view of what is involved for posterity in defense and preparedness we know it goes beyond those engaged in military activities and industrial workers. It means family life and particularly healthy mothers, babies, and children. Therein lies the future of any country if it is to have a future. This is accepted as our concern and responsibility even though there is still much to be done toward developing more adequate maternal and child health services. Thanks in large part to the public health nursing program of the Children's Bureau, we already have made tremendous advances. Whatever adjustments and changes may be necessary, let us never forget that defense relates to the long future as well as to the present and the near future, so that we are not sacrificing one for the other.

There is an aspect to maternal and child health services that has to do with the immediate present growing out of the war situation. Migrating families, including mothers and children and prospective mothers, are gathering around the cantonments and defense industries with little or no provision for anything that makes living healthy for anybody, under conditions that particularly endanger the lives of babies and little children. Federal, state, and local agencies are at work on how to meet this health menace that is being created.

Two other aspects of public health nursing content and service are accentuated in the light of the present situation and future possibilities. I am not sure but that these should come first on the list, for certainly they are now recognized as an inseparable part of any public health nursing. To give service in any health area includes relating it to the psychological, emotional, and social situation—to the need and capacity of the individuals and families involved and to their immediate health and

sickness problems. There is current terminology applied to these aspects of public health nursing—mental hygiene and bedside care.

MENTAL HYGIENE

The ability to help people to adjust, and to develop their capacity to take responsibility, must be part of the professional competence of all health workers. Any situation that threatens essential security, be it national, local, or individual, necessitates increased attention to mental health and adjustment. This attention and ability must be part of every professional service, every professional relationship. We have been saying this for some time. Now the only difference is that the threat of insecurity is greater and it becomes a question of national morale and stability as represented by each individual, each family, each community. Also there are special problems around the rejected draftee—health and psychological problems in which the public health nurse plays her part with other professions.

BEDSIDE CARE

Bedside care—what a controversial issue that has been in public health nursing in the past! To be or not to be—and how much? Most of the tumult and shouting on the subject of bedside care as an *issue* has died, although there still remains the economic problem of producing it in the amounts and in the places that it is needed for life saving and for health.

It is safe to say that national defense and preparedness for the possibility of war in this country require that every public health nurse, more than ever before, must accept as part of her professional responsibility, when the need for bedside care exists in any home, to give it or see that it is provided; to demonstrate it and supervise the care given by someone else; to assist

in teaching home nursing to individuals and groups.

The future health of anybody depends on the care he gets when he is sick. That has now become one of the first lessons in public health practice. Also, sickness usually starts and ends at home. The hospital may intervene between this beginning and the convalescence, but still the home bears a crucial proportion of sickness care and may be the predominant factor in recovery. If this is true in peace times, I do not need to point out the crescendo if war with its possible accompaniment of epidemics comes within our gates.

These are all aspects of the total public health nursing program that must be continued and extended because they are vitally and directly related to national defense today. They are essential whether we are concerned with the strength of our national bulwarks for resistance, for attack, or for preservation. But what of other questions of preparedness and responsibilities for the possible eventualities of tomorrow? For defense also means a planned organization of forces to meet any emergency. What steps are we taking and should we take toward this end?

COMMUNITY PLANNING

In the past, we have talked a great deal about community studies and organization so that public health nursing programs would really be developed and continued only in the light of revealed health needs and existing resources; so that gaps and duplications in services would be eliminated; and as a final goal, so that there would be a community plan with coördination of services, and in some instances a combination of agencies. What actually has taken place besides talk—talk in committees, on the platform, in publications? Something *has* happened in various localities and certainly an aware-

ness has been developed so that we have accepted a common goal. Public health nurses and agencies are playing an active part in many types of community councils and an increasing number of surveys are being made with progress in the fulfillment of their purpose. But by and large as we look over the country, I wonder if productive action has been in proportion to the talking. In any case, preparedness calls for more action, more leadership, and more statesmanship. There is no place for agency or professional separateness and there will be, or should be, no money, private or public, for any services not absolutely essential and efficiently administered.

Some services must be extended and new ones developed; others contracted and combined; and some eliminated within agencies and within communities if public health nursing is to be used to its capacity in meeting the present situation and any future emergency. Let us not wait until the situation forces this issue. Let us take the lead in putting our own house in order as part of our organized preparedness. Already we see this leadership being exerted by public health nurses and agencies in many places. But this kind of preparedness calling for critical analyses and courageous action that may mean adjustment and change, must take place in every locality and in every state.

The specific activities of the public health nurse in time of war or disaster have been described by Elizabeth Fox in a recent paper, "An Analysis of Defense Needs" (*American Journal of Nursing*, June, 1941), and they are therefore not included in the discussion.

THE NON-PROFESSIONAL WORKER

Now, and if war should come, we know that every ounce of nurse power must be conserved and increased for those services and responsibilities that can only be safely placed in the hands

of a professional nurse. This necessitates the use of various types of subsidiary workers and of volunteers. The use of volunteers is not new to public health nursing. It has been bound up with our historical development. But in actuality we still may be somewhat limited in making the most productive use of them. Now the situation demands not only imagination but the organization and direction of the use of both of these non-professional groups. If we act wisely and positively, and take the initiative in charting their use in public health nursing, it may be one of the real gains coming out of the destructive forces of war.

All that has been said in the past about their selection, preparation, assignment to suitable tasks and professional supervision, as basic safeguards to those whom we serve, must be said again and again in this emergency. These safeguards must be part of any community plan for their use in services that affect the health and welfare of human beings. Are we prepared to plan and act so that wherever the volunteer and subsidiary worker can be safely used in public health nursing today, they will be used? Have we an obligation to see to it that this happens, as part of our responsibility for the extension of our own professional services? If we do not meet this responsibility through our own leadership, it may be taken away from us with the possibility of resulting chaos.

CONCLUSION

There is really nothing vague or unknown about the part of public health nursing in national defense. What is new is the urgency of the situation with spot lights on certain aspects of our services which need more concentration and extension and, possibly above all else, on the necessity to evaluate and organize public health nursing for effective performance on a community basis

when and where the need is greatest as part of defense and preparedness for war within this land of ours.

Ever since we have been public health nurses, we have heard challenges. We have challenged ourselves and each other, and everybody has challenged us. Today and tomorrow present many of these same challenges as I have indicated, but there is a difference. There is more at stake and less time. It is *now*

that we must be prepared for adjustment, growth and action. *Now* we must make sure that the particular professional competence of public health nurses is utilized and increased quantitatively and qualitatively in direct relation to our specific opportunity and contribution to the saving of lives and the protection and extension of health for the defense and the future of this country.

Immunological Reactions in Rickettsial Diseases with Special Reference to the Time of Appearance of Antibodies*

FLORENCE FITZPATRICK AND BETTYLEE HAMPIL, Sc.D.

Medical-Research Division, Sharp and Dohme, Inc., Glenolden, Pa.

ALTHOUGH the Weil-Felix reaction has been widely used as a diagnostic aid in typhus and spotted fever since its discovery in 1915, only isolated facts are known concerning the presence of other antibodies in these diseases. Early in the study of typhus fever, Epstein¹ reported that convalescent sera agglutinated antigen prepared from infected lice. This observation was confirmed by Zinsser and Castañeda² who found that patients convalescent from murine typhus agglutinated European as well as murine rickettsiae. It was shown by Castañeda³ that the agglutination of proteus organisms by convalescent typhus sera could be explained on the basis of there being a common antigen in rickettsiae and proteus bacilli. This he found to be a specific, soluble substance, probably a polysaccharide.

Opsonins in typhus fever as well as complement-fixing antibodies were studied by Castañeda.^{4, 5} He noted that opsonins appeared in infected guinea pigs as early as 96 hours after inoculation, and that they persisted in man for many years after infection. Comple-

ment-fixing antibodies were present in human convalescent sera as long as 6 years after infection. More recently, Bengtson in typhus and "q" fever studies has found that complement-fixing antibodies are present in guinea pigs as early as the 6th and 9th days respectively after the onset of fever,^{6, 7} and that they persist in recovered typhus patients for several years.⁸

No correlation has been shown to exist between the Weil-Felix and the presence of rickettsial agglutinins and protective antibodies.

The aim of the work here reported was to find (1) the time of appearance of these antibodies, and (2) their relation to each other and their persistence in the convalescent animal. Rabbits were chosen as the most convenient animal, since it was found some years ago in work with Dr. Zinsser that they produced antisera of high protective power as a result of inoculation with cultures of typhus and an eastern strain of spotted fever.

METHODS AND MATERIALS

The technic followed and the results obtained were the same for both types of rickettsiae. Cultures grown on agar in 8 x 3.5 in. bottles with chick embryo

* Read before the Laboratory Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

tissue were used as inoculum. The infected tissue was removed and suspended in phosphate buffer solution at a pH of 7.1 to 7.4, just prior to injection. Antigen for the agglutination tests was prepared by differential centrifugation of ground culture material suspended in 0.2 per cent phenol or formolized phosphate buffer. The agglutination tests were performed by adding antigen to the serum dilutions in hanging drop slides and incubating for 4 hours at 40° C. Rabbits weighing about 5 pounds were employed, and injections were given by the intraperitoneal route. Twenty-five were used for the spotted fever studies, 4 being selected for close observation, with frequent bleedings for agglutination and protection tests on the serum of each animal. Twelve rabbits received inoculations of typhus, and all were followed in a similar manner. Some of the animals received weekly injections for from 4 to 20 weeks, others were given two or three injections only, at intervals of 3 days. Protection tests were performed by mixing 1 ml. of virulent passage blood with varying

amounts of rabbit serum, after it had been kept several weeks in the icebox, and injecting the mixtures intraperitoneally into guinea pigs.

RESULTS

The sequence of appearance of the antibodies studied was always the same, although individual variation among the rabbits in the actual day of appearance of the antibodies was found. The rickettsial agglutinins appeared first, from the 5th to the 8th day after the first injection; next the proteus agglutinins, from the 7th to the 14th day. A few rabbits did not develop a Weil-Felix reaction; all developed rickettsial agglutinins and in high titer (1/1,000 to 1/10,000). It was found on several occasions that, in spite of a high titer of rickettsial agglutinins, whole rabbit blood was infectious for guinea pigs as late as the 14th day after the first injection. Between the 12th and 18th day, when the blood no longer contained live virus, the protective antibodies appeared (see Tables 1 and 2). Once the protective antibodies appeared, they

TABLE 1

Typical Immune Response of a Rabbit Following 3 Injections of Spotted Fever Rickettsiae at 3 Day Intervals
Rabbit No. 3 S.F.

Time of Bleeding	Agglutinin Titer		Blood Infectious	Protective Antibodies	
	Weil-Felix	Rickettsia		Amount of Serum	Results
1 week	0	1:80	yes	1.0 ml.	absent
2 weeks	1:160	1:1,280	no	1.0 ml.	present
3 weeks	1:80	1:1,280	no	0.5 ml.	present
6 weeks	0	1:1,280	...	1.0 ml.	present
			

TABLE 2

Typical Immune Response of a Rabbit Following Weekly Injections of Typhus Rickettsiae
Rabbit No. 296.T.

Time of Bleeding	Agglutinin Titer		Blood Infectious	Protective Antibodies	
	Weil-Felix	Rickettsia		Amount of Serum	Results
1 week	1:80	1:1,280	yes	1.0 ml.	absent
2 weeks	1:20	1:1,280	yes	1.0 ml.	absent
3 weeks	0	1:1,280	no	1.0 ml.	present
				0.5 ml.	present
6 weeks	0	1:1,280	no	1.0 ml.	present
				0.5 ml.	present

were very potent. From some rabbits as little as 0.005 ml. completely neutralized 1 ml. of virulent blood. When a pool of serum from several rabbits was used, 0.01 ml. usually was required.

As to the persistence of these antibodies in the rabbit, it was observed that, despite the weekly injections, the proteus agglutinins dropped to zero in from 1 to 5 weeks, depending on the height to which the titer had initially risen. The rickettsial agglutinins, on the other hand, were maintained at a high level for many months, even in rabbits whose inoculations were discontinued. We are not yet able to state how long rickettsial agglutinins may persist in the rabbit; it is at least 7 months. Protective antibodies seem to belong in the same category. They appear to last as long as the rickettsial agglutinins. It is hoped that, by following rabbits for a sufficiently long time, it may be observed whether these

antibodies last the same length of time. If they should disappear, it would then become necessary to determine the susceptibility of the animals to reinfection (see Charts I and II).

The application of these experimental findings to the immunity response of man to these rickettsial diseases may have its practical significance. Studies now in progress on human sera from a small number of cases of spotted fever have already shown interesting similarities. The proteus agglutinins in man are much reduced or disappear altogether during convalescence. Also, in the acute disease in man, as in the rabbit, rickettsial agglutinins have been demonstrated in the absence of a Weil-Felix reaction. This absence has usually been interpreted as signifying a poor prognosis in the human disease. On the other hand, our results in the rabbit indicate that a positive Weil-Felix reaction is not essential to immunity, and

Chart I

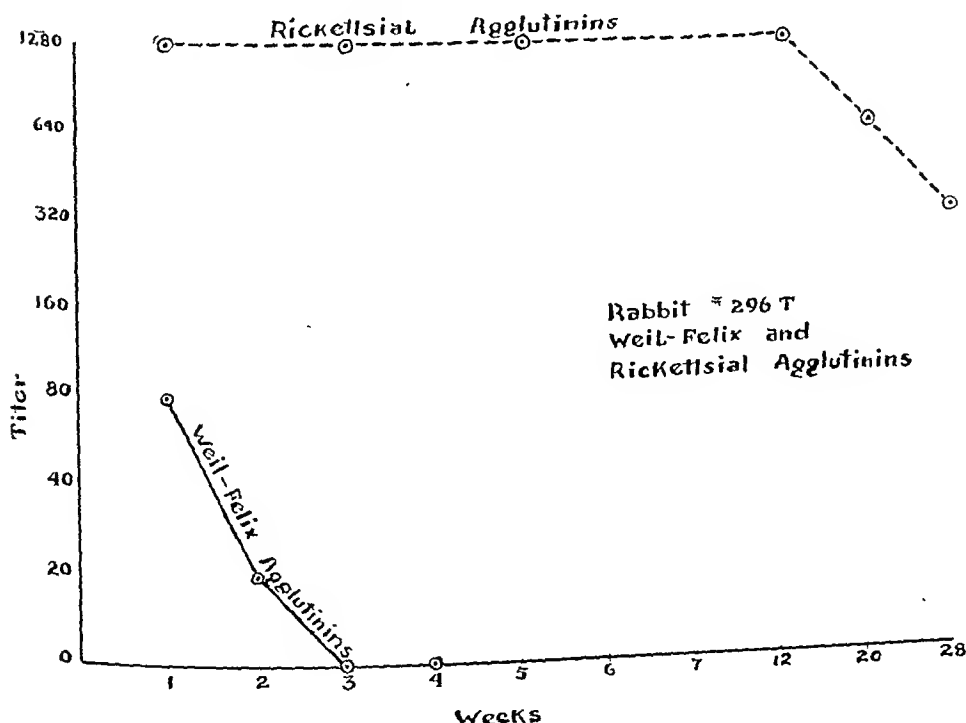
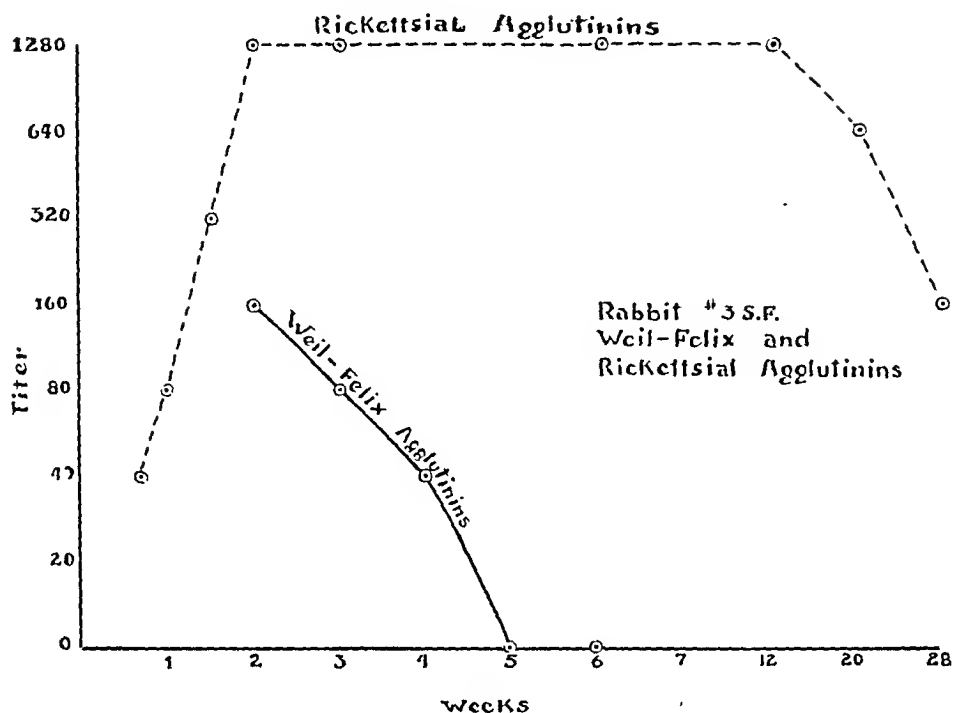


Chart II



that its absence does not influence the development of rickettsial agglutinins and protective antibodies.

A close study of a number of human cases will be required to determine whether the rickettsial agglutinins precede the appearance of the Weil-Felix reaction. If so, the rickettsial agglutinin test would prove valuable as a more rapid and specific diagnostic test in suspected rickettsial disease, especially in areas where both typhus and spotted fever occur.

SUMMARY

Studies were made to determine the time of appearance of antibodies and their persistence in typhus and spotted fever. Rabbits were injected with live cultures intraperitoneally. Bleedings were taken at frequent intervals to follow the development of agglutinins and protective antibodies. It was found that the sequence of appearance of these antibodies was always the same, though some individual variation among the

animals in the actual day of their appearance was noted. The rickettsial agglutinins appeared between the 5th and 8th day; the proteus agglutinins between the 7th and 14th day after the first injection. The protective antibodies appeared last, at a time when the rabbit blood was no longer infectious for guinea pigs. Some of the animals did not develop a Weil-Felix reaction, but this absence of proteus agglutinins did not affect the development of rickettsial agglutinins and protective antibodies in high titer. The Weil-Felix reaction dropped to zero in from 1 to 5 weeks even in animals which continued to receive injections. The rickettsial agglutinins and protective antibodies persisted for as long as 7 months. The length of time these antibodies can be demonstrated is yet to be determined. Whether their disappearance is unimportant or coincides with renewed susceptibility to infection on the part of the rabbit must also be shown.

Efforts are being made to apply these findings to the study of sera from human cases of spotted fever.

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Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year 1940-1941 *

THE Committee on Professional Education of the American Public Health Association presents a report of public health degrees and certificates granted in the academic year 1940-1941. With the exception of the public health nursing tables, the Committee has included only graduate students enrolled in courses leading to graduate degrees and certificates. The basis for the record is *the number of students who received degrees* rather than the number of degrees granted in the specified period.

Graduate Students Enrolled and Degrees Granted in Public Health Engineering and Sanitary Engineering Courses in the Academic Year 1940-1941

TABLE 1

<i>Name of University</i>	<i>Number of Graduate Students Registered</i>	<i>Graduate Degrees Offered</i>	<i>Number of Graduates Receiving Each Degree</i>
Agricultural & Mechanical College of Texas	12	M.S. Ph.D.	2 0
Cornell University	3	M.C.E. Ph.D.	1 1
Harvard University	36	M.S. Sc.D.	30 1
Iowa State College	2	M.S. in San. Eng. Ph.D. in San. Eng.	0 0
Johns Hopkins University	5	Dr.Eng. M.C.E. M.P.H.	0 1 1
Massachusetts Institute of Technology	3	Sc.D. S.M.	0 1
New York University	36	M.C.E. Dr.Eng.Sc.	9 0

* For previous reports see A.J.P.H., Vol. 30, p. 1456; Vol. 29, p. 1338; Vol. 28, p. 863; Vol. 27, p. 1267; Vol. 26, p. 819; Vol. 25, p. 341; Vol. 23, p. 1124.

TABLE 1 (Cont.)

<i>Name of University</i>	<i>Number of Graduate Students Registered</i>	<i>Graduate Degrees Offered</i>	<i>Number of Graduates Receiving Each Degree</i>
Rutgers University	3	M.Sc.	2
Stanford University	4	Eng. in C.E.: S.E.	1
State University of Iowa	0	M.S. in San. Eng. Ph.D. in San Eng.	0 0
University of Alabama	0	M.S. in San. Eng. M.S. in P.H. Eng.	0 0
University of Illinois	4	Ph.D. in C.E. M.S. C.E.	0 0 2
University of Kansas	0	M.S. in San. Eng.	0
University of Minnesota	11	M.S. M.P.H.	1 0
University of North Carolina	11	M.S. in P.H. M.S. in S.E.	4 2
University of Toronto	0	M.A.Sc.	0
West Virginia University	0	M.S.C.E.	0
Total	130		59

Classification of Engineering Degrees Granted in the Academic Year 1940-1941

TABLE 2

	<i>Number of Graduates Receiving Degrees</i>	<i>Number of Schools Offering Each Degree</i>
Doctor of Philosophy	1	5
Doctor of Engineering	0	1
Doctor of Science	2	2
Doctor of Engineering Science	0	1
Master of Public Health	1	2
Master of Science in Public Health	4	1
Master of Science in Public Health Engineering	0	1
Master of Science in Sanitary Engineering	2	5
Master of Science	35	7
Master of Civil Engineering	11	4
Engineer in Civil Engineering	3	2
Total	59	

In the academic year 1939-1940, 131 graduate students were enrolled in public health engineering and sanitary engineering courses as compared with 130 in the academic year 1940-1941. Graduate degrees granted in the academic year 1939-1940 totalled 66 as compared to 59 in the year 1940-1941.

Enrollment in Public Health Courses and Degrees and Certificates Granted

(Exclusive of Engineering and Nursing Students)

Number of graduate students enrolled and public health degrees and certificates conferred during the academic year 1940-1941 by United States and Canadian universities. Unless otherwise indicated, courses require at least one year of residence. The professional background of the students is given where known.

TABLE 3

Name of Institution	Total Number Graduate Students Registered	Physicians	Dentists	Nurses	Public Health Laboratory Workers ²	Public Health Engineers	Sanitarians	Health Educators	Statisticians	Physical Educators	Entomologists	Public Health Nutritionists	Food and Drug Inspectors	Veterinarians	Pharmacologists	Instructors	Social Workers	Unclassified	Graduate Degrees Offered	Number of Graduates Receiving each Certificate
DeLamar Institute of Public Health, Columbia University	21	19	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	{Dr.P.H. {M.S.P.H.	0 22
Harvard School of Public Health	51	41	3	..	4	..	..	..	..	..	..	..	3	..	..	..	..	..	{Dr.P.H. {M.P.H. {C.P.H.	6 6 8
Johns Hopkins University	127	89	..	..	4	..	..	..	2	..	1	..	..	..	..	3	..	28 ^a	{Dr.P.H. {M.P.H. {Sc.D. in Hyg. {Sc.M. in Hyg.	7 77 5 2
Loyola University	10	..	..	4	..	1	3	..	..	2	..	..	..	..	..	..	..	..	{Dr.P.H. {M.S.P.H.	0 1
Massachusetts Institute of Technology	33	4	1	..	5	5	..	18	..	..	..	..	..	..	..	..	..	..	{Dr.P.H. {M.P.H. {C.P.H.	0 2 7
McGill University	10	5	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	{D.P.H. ³ {D.V.P.H. ⁴	4 5
University of California	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{Dr.P.H. {M.S.P.H. ³ {M.A.	0 (16) 1
University of Kentucky	25 ^a	24	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	M.S.P.H.	4
University of Michigan	176	46	15	20	13	12	20	41 ⁷	4	..	..	4	..	..	..	..	1	..	{Dr.P.H. {M.S.P.H.	4 51

TABLE 3 (Cont.)

Name of Institution	Total Number Graduate Students Registered	Physicians	Dentists	Public Health Nurses	Public Health Laboratory Workers ¹	Public Health Engineers	Sanitarians	Health Educators	Statisticians	Physical Educators	Entomologists	Public Health Nutritionists	Food and Drug Inspectors	Veterinarians	Pharmacologists	Instructors	Social Workers	Unclassified	Graduate Degrees Offered	Number of Graduates Receiving each Certificate
University of Minnesota	17	13	1	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	{M.P.H. M.S.	8
University of North Carolina	37	18	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	18	{Dr.P.H. M.P.H. M.S.P.H. Ph.D. C.P.H.	0 0 5 8 0 3
University of Pennsylvania	44	19	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	23	{Dr.P.H. M.P.H. M.S. Ph.D.	0 11 10 1
University of Toronto	27	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	D.P.H. ²	25
Yale University	42	25	..	2	2	..	1	10	2	..	..	..	..	..	..	..	..	..	{Dr.P.H. M.P.H. Ph.D.	3 18 0
Total	621	331	23	27	28	18	24	70	9	3	1	4	3	5	1	3	1	70		304

¹ This classification covers pathologists, parasitologists, bacteriologists, serologists, chemists, immunologists and technicians² Among the unclassified 4 were student assistants in immunology, biochemistry, protozoology and medical entomology³ Diploma in Public Health⁴ Diploma in Veterinary Public Health⁵ M.S.P.H. granted to 16 students in the upper fraction of classes who had previously received the C.P.H.⁶ These students spent 36 weeks in residence during summer sessions⁷ Health and Physical Educators

**Classification of Public Health Degrees and Certificates Granted
in the Academic Year 1940-1941**

(Exclusive of Engineering and Nursing Degrees and Certificates)

TABLE 4

<i>Degree or Certificate</i>	<i>Number of Graduates Receiving Degrees and Certificates</i>	<i>Number of Schools Offering Each Degree and Certificate</i>
Doctor of Public Health	20	10
Doctor of Science	5	1
Doctor of Philosophy	1	3
Certificate in Public Health	18	3
Master of Public Health	127	7
Master of Science in Public Health	86	6
Master of Science	12	3
Diploma in Public Health	29	1
Master of Arts	1	2
Diploma in Veterinary Public Health	5	1
Total	304	

In the academic year 1939-1940, 550 graduate students were enrolled as compared with 621 in the academic year 1940-1941. Graduate degrees and certificates granted in the academic year 1939-1940 totalled 331 as compared to 304 in the year 1940-1941.

**Students Enrolled and Degrees and Certificates Granted in Public Health
Nursing for the Year Ending June 30, 1941**

Five thousand nurses studied public health nursing in the 27 programs of study meeting the approval of the Education Committee of the National Organization for Public Health Nursing during the year ended June 30, 1941. Baccalaureate degrees were granted to 339 of these students and masters degrees to 42. In the programs of study of 19 universities, certificates were awarded to 568 nurses.

There were four universities in which more than 400 public health nurses were enrolled during the year—Wayne University at Detroit; Teachers College at Columbia University, New York; New York University; and George Peabody College for Teachers at Nashville.

Table 5 indicates the enrollment and the number of students who received degrees and certificates for this period. These figures have been compiled by the National Organization for Public Health Nursing and are printed here with permission.

TABLE 5

<i>Name of University</i>	<i>Number of Students Registered</i>	<i>Number of Students Receiving Each Degree and Certificate</i>		
		<i>Bacca- laureate Degrees</i>	<i>Masters Degrees</i>	<i>Certificates</i>
Catholic University of America	73	6	0	5 ¹
Columbia University, Teachers College	517 ²	55	17	0 ³
Duquesne University	60	3	0	3
George Peabody College for Teachers	425	19	4	97
Indiana University	39	10	0	0
Loyola University ⁴	183	3	0	12
Marquette University	86	1	0	12
Medical College of Virginia	38	0	0	22
New York University	1,310 ⁵	58	7	0

TABLE 5 (Cont.)

Name of University	Number of Students Registered	Number of Students Receiving Each Degree and Certificate		
		Bacca- laureate Degrees	Masters Degrees	Certificates
Richmond Professional Institute, College of William and Mary	101	6	0	51
St. John's University	83	0	0	0
St. Louis University	91	9	0	0
Simmons College ^a	...	..	..	..
Syracuse University	173	3	0	20
University of California, Berkeley	94	31	0	53
University of California, Los Angeles	40 ²	8	0	24
University of Chicago	74	2	0	0 ³
University of Hawaii	8	0	0	6
University of Michigan	232	13	3	35
University of Minnesota	294	62 ⁷	5	7
University of Oregon	84	7	0	49
University of Pennsylvania	313	11	1	37
University of Washington	112	14	1	24
University of Wisconsin ¹	29	3	0	0 ³
Vanderbilt University	39	2	0	20 ⁸
Wayne University	404	5	1	40
Western Reserve University	106	8	3	51
Total	5,008	339	42	568

¹ Certificates not granted but course meets in full N.O.P.H.N. requirements for certification.

² Does not include registration in summer session courses.

³ Does not grant certificates.

⁴ Newly approved in 1941.

⁵ Estimated figure.

⁶ No information.

⁷ Each student granted a degree is automatically granted a certificate in public health nursing.

⁸ Does not grant certificates, but course meets in full requirements for certification.

Summary of Students Registered and Degrees and Certificates Awarded to Nurses in 1940 and 1941

TABLE 6

	1940-1941	1939-1940
Nurses enrolled	5,008	5,139
Baccalaureate degrees granted	339	417
Masters degrees granted	42	47
Certificate granted	568	512

W. P. SHEPARD, M.D., *Chairman*

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THE NEW INTEREST IN ADOLESCENCE

NOT long ago we sat in on a discussion of the physiological and emotional aspects of adolescence. No great truths were uncovered and it is doubtful that anyone came away from the meeting much the wiser. And yet that discussion and others, formal and informal, did and will continue to do good. At the meeting in question, which was made up of only a few people, two things stood out squarely: First, it was noticeable that those who had weathered the storm of adolescence in their own children did not consider themselves possessors of authoritative knowledge because of such an experience. The second outstanding thing was that a charming young woman, too young to have any adolescent children and unmarried, did have some opinions and no small fund of information as to what is taught and being done in relation to adolescence; and she was listened to respectfully. This willingness of parents to admit ignorance and their concession that a knowledge of adolescence might be acquired as might knowledge of any scientific subject, leads one to hope that the recent interest in this matter is developing along sound lines.

Unfortunately, the adolescent is not amenable to analysis as is a sample of water or an autopsy specimen. On the contrary, in each individual, adolescence is a kaleidoscopic and complex thing, a maturation process compounded of chemistry and psychology, with maleness and femaleness and endocrines and emotions unsnarling themselves: a period of development and adjustment where a sense of insecurity darkens a childhood assurance of safety, where idols fall and independence beckons, where old interests are lost and the most enticing new ones are taboo. It is a beautiful and painful episode in human development and, fortunately or unfortunately, nothing like its glow and shadow will ever come again. And because of driving physiological impulses and emotions, and a natural intolerance of restraint, it is only with the utmost wisdom and tact that the adolescent may be steadied, guided, and brought finally to a haven of mental and ethical adulthood.

Heretofore the adolescent period has been regarded almost entirely from the standpoint of the parent, something with which fathers and mothers must contend as children grow up. The more modern and constructive approach considers the

problem as it relates to the millions of young people who are going through this process. The importance of seeing the problem from this standpoint cannot be overemphasized for in adolescence there occurs the final shaping of the adult personality, when character, sense of values, moral and ethical concepts are fixed in the mold. Naturally, the basis for many of these intangibles will already have been laid in the earlier years of childhood, and in a few instances children will go into adolescence already so seriously scarred nervously and mentally that not much can be done about it. On the other hand, some with more fortunate inheritance and environment, and perhaps with wiser parents, will already have so thoroughly established a background of emotional balance and sense of values that they will be only slightly disturbed no matter what confusion adolescence brings.

In any event, one must welcome the new and intensified interest in this subject. It is to be hoped that the recent evidence of an unemotional approach to this emotional subject will be continued. This will be difficult, for the cool tools of science tend to heat up and lose their fine edge when applied to the knotty problem of human behavior. Finally, it must not be forgotten that there are physical as well as emotional and ethical problems in adolescence: the young man or woman going into industry, the nutritional demands at this age, the matter of dental care, the shadow of tuberculosis, and the danger of the venereal diseases.

CUCKOOS AND PRAIRIE CHICKENS

GREENWOOD, in his *Epidemics and Crowd Diseases*, devotes a chapter to Charles Creighton and Edward Jenner. To Creighton, Jenner was anathema, and no good could or should have come out of the latter. One of the things that seemed particularly to infuriate Creighton was that Jenner, on the basis of one observation, reported certain nesting habits of cuckoos, and described the young cuckoo as being equipped with a hollow in his back and an urge in his being which made it practicable for him to oust his fledgling foster siblings from the nest to which, at most, the cuckoo had established only squatter's rights. Creighton doubted the whole business, in which apparently he was wrong, and, to put it mildly, he criticised Jenner for making such a sweeping statement on the basis of one observation, in which, in principle at least, Creighton was undoubtedly right.

This brings us to a recent news release of the U. S. Public Health Service in regard to prairie chickens and infectious encephalitis. The announcement refers to the encephalitis epidemic of last summer which was focused in the Dakotas, Minnesota, and in nearby sections of Canada. The news release mentions the previous establishment of mosquitoes as possible vectors of encephalitis, refers to the relatively low incidence of the disease in local horses at the time of the epidemic, and draws attention to the fact that this was "a heavy mosquito year in North Dakota." The announcement then proceeds, "It appeared, therefore, that mosquitoes were spreading the disease. This theory was strengthened by the fact that the epidemic was unusually heavy among adult males. Since the mosquitoes of this region which can transmit encephalitis were of the field varieties and since in this area the male population of working age has a greater exposure in the wheat fields than women, a warning against mosquitoes was issued."

"There remained, however, the question of the mosquitoes' source of infection. Discovery of the virus in the prairie hen is believed to be an answer, since the bird spends most of its life in the grain fields."

We know too well the traditions of the Public Health Service, and respect its workers too much to entertain any doubt that this whole matter will be explored further and exhaustively. In fact, we forecast confidently that it is going to be a hard year for prairie chickens. On the other hand, we must confess a somewhat Creightonish reaction to the phraseology of this one—observation announcement. We are not, of course, in position to say that one prairie chicken does not make a summer epidemic, nor can we forget that Jenner had nothing more than one cuckoo observation for the establishment of an important bit of natural history. Still we do wish there had been a little more caution in the Service announcement, a little more restraint. The bare facts constitute a good circumstantial case against the prairie chicken, but it is to be doubted that they should be indicted without further evidence. As a circumstantial case, we have no quarrel with it. But the news release as worded is, we think, not a good example to the young and over eager.

Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

BY WAY OF REPORT

Another Health Education Institute is behind us. If the 480 "students" who were present could express themselves collectively, they would no doubt pronounce it (with little, if any, dissent) the outstanding Institute to date in the series. The proceedings were notable on many counts, but the one thing that particularly vitalized this year's sessions was the eager and alert participation of the various audiences. As a general rule, coaxing and priming are necessary to get group discussions under way, but speakers and panel leaders found the Institute audiences quick to respond, to question, and to challenge. This made for sessions that were lively, stimulating, and thought-provoking. Another feature of the Institute sessions that was decidedly welcome was the emphasis on the practical application of health education. In many sessions, comments similar to the following were heard: "My exhibit on diphtheria wasn't successful and yet I followed all the accepted technics of exhibit construction and display. Can't we discuss my problem and get at the facts?" And thereupon an analysis of the situation took place. It was reassuring to find that everyday problems could be explored and practical advice given as to their solution. We hope that future Institutes will also be long on practicality and short on theory.

A complete record of the 3 day program will be made available later with the publication of the monograph: *Proceedings of the Eighth Health Education Institute*. Hence a detailed report of the Institute in these columns would only be repetitious. But there are certain things that stand out in retrospect which the formal record of the Institute will perhaps not reflect. Thus, it would not be amiss to refer to some of them here.

First, a word about Dr. Hiscock. At the dinner meeting held prior to the opening session, he termed himself "the humble servant of the Health Education Institute." The extraordinary degree of planning and preparation that is necessary in organizing the Institute does require an "humble servant"—someone who is willing to see a thing through from beginning to end without shifting responsibilities to others. Dr. Hiscock devotes himself to this undertaking with something akin to reverence, and health educators who have profited by recent Institutes owe a debt of gratitude to Dr. Hiscock and his committee.

It is regrettable that a larger audience could not have heard Dr. H. A. Overstreet's address, which preceded the formal opening session of the Institute. His informed comments on how to lead discussion groups will no doubt bear fruit in many communities where the technics which he outlined can be put to use in meetings, forums, and the like. This speech led to a great deal of "celebrating" on the part of the small

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dinner group, and Dr. Overstreet skillfully demonstrated that he could practise what he preached, as he drew from the audience question after question. He ranks with the experts of "Information, Please" when it comes to giving correct answers to difficult queries.

A lively demonstration of health educators at work was seen during the general session presided over by Dr. Mayhew Derryberry. Presented with a complicated situation involving a number of intensified health problems connected with army camps, the audience was asked to tackle the problems and offer possible solutions. It gave one a decided "lift" to watch the audience organize itself into committees and proceed without the slightest hesitation. Let's hope that actual problems facing health educators are solved as speedily and efficiently as Dr. Derryberry's problem-on-paper was solved.

The sessions on exhibits, conducted by Homer Calver and Dr. Bruno Gebhard, reflected much of the practical experience which these experts have had. If the excellent advice of Mr. Calver concerning the make-up of exhibits were followed, and if the common pitfalls enumerated by Dr. Gebhard were avoided, one would be less likely to go off the deep end when making exhibits. While on this subject, one is reminded of the very excellent group of exhibits displayed during the Convention. The commodious hall afforded a splendid setting, and appreciative crowds rewarded the exhibitors with a steady round of compliments. We do not recall seeing another group of exhibits as interesting, colorful, ingenious, and instructive as those of the U. S. Public Health Service, the New York State Department of Health, the Pan American Sanitary Bureau, and the National Foundation for Infantile Paralysis.

The clinic on printed materials conducted by John Hall ranks as one of the highlights of the Eighth (or any

other) Institute. Mr. Hall added something new to this clinic by bringing an experienced newspaper editor before the group to analyze or evaluate certain health publications. The editor pulled no punches and, as a result, a completely unbiased estimate of a representative selection of pamphlets, annual reports, leaflets, etc., was obtained. Our mistakes were exposed and our virtues extolled with equal candor by the newsman. Many of us are now better equipped to tell our stories to the public—thanks to the editor and the hints that he gave about influencing public opinion or impelling desired action through the printed word.

From all sides one heard reports of other sessions equally as profitable and ably conducted as those just mentioned. The well filled notebooks seen were evidence of the fact that the Institute supplied its "students" with a wealth of new ideas and material that would be used to fertilize the growth of health education in cities, counties, and schools throughout the land. Those who were able to follow an uninterrupted schedule during the 3 day session might well feel that they had received the equivalent of a compact course in health education.

Various bits of news or casual observations connected with the Institute and the Association's meeting come to mind again as one reviews the Atlantic City gathering. For instance: The speakers at the final Institute session gave excellent resumés of the proceedings—by listening attentively one got the whole of the Institute in a nutshell from these adept "summers-up". . . . Dr. Alice Keliher's motion picture demonstration with high school students was a top-notch performance. Her ability to arouse boys and girls amounts almost to genius. How does she do it? We suspect the secret of her success lies in the fact that Dr. Keliher makes herself one of the group—"boys and girls together," so to speak. . . . Dr.

Harry Mustard's definition of health education, as given in his paper at the opening session of the Institute, is worth remembering: "Health education is that process or those procedures through which individuals are brought to a performance of those things beneficial to health" (slightly abridged). . . . The Motion Picture Theatre offered an excellent program of health films. This popular feature of the annual meeting was capably directed by Thomas Stowell and his assistants of the New York State Department of Health. . . . It is always good to see those three stalwart veterans of public health at the annual meetings: Sally Lucas Jean, Dr. Charles Bolduan, and Dr. James Hayne. . . . The dramatic display of photographs depicting life in war-torn Britain brought to mind that nation's dark days more vividly and realistically than all the foreign dispatches and broadcasts on the subject. . . . It was interesting to note the increasing use of "demonstration material" in exhibits: White mice, mosquitoes, and trichinae were displayed at three exhibits and on-lookers were numerous. . . . Certain suggestions made by Dr. John L. Rice in his inaugural address aroused immediate interest—chiefly, his proposal that public health nurses give bedside care and that more emphasis be placed on health teaching in schools. . . . The exhibits, booklets, and posters of various federal agencies are setting a high standard as regards presentation of material, art work, and general appeal. One who remembers earlier efforts of the government agencies cannot help but marvel at the vastly improved techniques employed in each of these media. . . . Any speech by Surgeon General Thomas Parran is an event of first importance, his utterances at the annual meeting being no exception. . . . There are some very pretty women in public health. The pulchritudinous element was larger than ever this year due to

the charming Latin ladies who were present with their husbands, the directors of various Latin-American health services. . . . We heard some good advice about the use of colorful words in health copy. We were told to take a tip from the advertisers who "sell the *sizzle*, not the steak." . . . We shall long remember the unassuming manner, the refreshing modesty of Dr. Charles Armstrong as he accepted the Sedgwick Memorial Award from Dr. Thomas Parran. One of his remarks typified the spirit of the true scientific investigator: "I have only been doing my day's work." . . .

The Health Education Center conducted by Mrs. Mary Swain Routzahn rendered a splendid service to hundreds seeking advice on films, annual reports, posters, literature, and other publicity media. The extensive collection of source material on display contained the best examples of health publicity obtainable. Mrs. Routzahn and her associates are to be congratulated on their important contribution to the annual meeting. . . . Dr. Hiscock and others frequently spoke of the new leaders who are emerging in health education. Among those rapidly forging their way ahead are Robert Schmuck and Howard Ennes of the U. S. Public Health Service and Marjorie Craig of the Metropolitan Life Insurance Company. Mr. Schmuck has introduced fresh technics in exhibit making, Mr. Ennes has capably conducted a venereal disease information service, and Miss Craig has sought to utilize nursery school education as a part of the public health program. . . . The friendly spirit that pervades the Health Education Institute each year is another factor which contributes to the success of these meetings. If the registration continues to mount, this camaraderie is apt to diminish. Hard and fast rules regarding registration would seem to be in order for 1942!

"WHAT'S IN A NAME"

One of the keenest jibes yet taken at the expense of the jargon coiners is contained in a story credited to Superintendent Langworthy of the Gloversville, N. Y., School System. This story was repeated at the Health Education Institute by Dr. Dorothy Nyswander. It made such a hit with the audience that "Credit Lines" immediately sought a copy to run in these columns for readers who may have missed the story. Here it is:

"About 1900 a teacher at the University of Iowa brought a hen to class for teaching purposes. While this was quite an innovation at the time, the hen was simply a hen. About 1910 this hen had become a 'problem.' In 1915 it had become a 'project.' Around 1919 the hen was 'a unit of work.' By 1925 it had become an 'activity.' In 1930 it was 'the basis of an integrated program.' And lo! in 1936 the poor hen had become a 'frame of reference.' As 1941 draws to a close, the hen is an 'area' in a 'workshop.'!"

The social worker has his lingo that is just as meaningless to the outsider as that of the educator. Until we all speak the same language, the health worker will have to do the best he can to understand the fancy terminology of his professional associates!

AN "EDITORIALETTE":

HEALTH EDUCATION IN A FREE SOCIETY

Health education is indigenous to democracy—to our free society, where initiative, judgment, and individual decision and enterprise still function—where it is still possible and indeed necessary to try to inform and persuade people as to what they should do for the benefit of themselves and the community. On the other hand, health education and indeed all education as we know it, are of disappearing importance in most of the rest of the world, where the "educator," turned

propagandist, tells the people what to do, although even in Germany the chief propagandist is said recently to have lamented the fact that there were still a few people in his country who could not be told how to act, and live, and think.

Health education, and indeed all education, as we think of it in America, is not only an essential ingredient in the free democratic process. Today, more than ever before, it must play a vital part in sustaining and justifying our way of living. As Hutchins has said, "What the world needs, what this country must have, is free minds . . . minds informed by principles derived through human experience through the ages, minds that are open no matter what waves of change beat upon them." Such education, in all fields, including public health, is in the long run our chief defense against the growing trends toward socialization, collectivism, dictatorship and totalitarianism, both abroad and at home.

IN HONOR OF EHRLICH

A dinner in commemoration of the 30th anniversary of the discovery of salvarsan by Paul Ehrlich was held by the American Social Hygiene Association in New York City on October 11, 1941. Among those who paid tribute to Dr. Ehrlich's far-reaching research in the control of syphilis were Surgeon General Thomas Parran and Father Alphonse M. Schwitalla, Dean, St. Louis University School of Medicine. The guest of honor at the dinner was the 78 year old widow of Dr. Ehrlich, who has come to this country to make her home. Mrs. Ehrlich was presented with a check for \$1,000 by Dr. Hubert S. Howe, Chairman of the Association's Committee on Research in Syphilis.

In a brief address Mrs. Ehrlich told of her husband's love for America and his desire to undertake medical research here. She also spoke of Ehrlich as a

man—how he was sometimes moved to tears when he read severe criticisms of his discovery and how he was accustomed to say that “scientific achievement depends upon four G’s: Geld, Geduld, Geschick, and Glück” (money, patience, cleverness, and luck). A host of Mrs. Ehrlich’s admirers wish her many years of happiness as she joins her daughters here to make her home.

This commemorative dinner was widely reported in the press and over the radio. Arrangements for the occasion were under the direction of Miss Eleanor Shenehon, with Joseph L. Stenek in charge of publicity.

HEALTH EDUCATION COURSE AT HOPKINS

The September–October number of the *Baltimore Health News* contains an interesting description of a course in health education for health educators given for the first time by the Johns Hopkins School of Hygiene and Public Health, March 25 to May 15, 1941. The course was conducted by Dr. William H. F. Warthen, Health Officer of Baltimore County and Lecturer at the School of Hygiene. Twenty-three students representing 14 states and 3 foreign countries were enrolled.

The course was carefully and thoroughly designed. Lectures and conferences covered such subjects as printed matter, radio, exhibits, motion pictures, meetings, and health campaigns. In addition to classroom activities, the students were taken on visits to radio stations, printing plants, and newspaper offices to gain first-hand information on broadcasting and the production of printed materials. Dr. Warthen’s lectures were supplemented with talks delivered by newspaper writers and radio program directors.

The course is reported to have been highly successful. Enrollment will no doubt increase, as courses organized along the lines of this one are eagerly sought by health workers and teachers.

HOW GAY WERE THE “NINETIES”?

According to song and story there would seem to be only one answer to this question, which was posed by the Wisconsin State Board of Health in a recent issue of its *Quarterly Bulletin*. Looked at from a health angle, however, the Gay Nineties weren’t so gay after all. For instance, the Wisconsin authorities point out, during those so-called good old days smallpox was rampant in their state, tuberculosis was striking at thousands, and cases of typhoid fever were mounting. Moreover, July 4th celebrations during the Gay Nineties were deadly affairs. A national count in one year during the era disclosed total firecracker casualties at close to 5,000—including 470 deaths.

Public health workers aren’t apt to heave any nostalgic sighs for the Gay Nineties and we agree with the Wisconsin authorities that “we’ll take these Forties, grim as the world looks”!

RE: CONFERENCES AND LECTURES

The Medical Information Bureau of the New York Academy of Medicine recently held a one day Conference on Health Education. This was the second in a series of annual conferences, the first having been held in October, 1940. These conferences are presented primarily as a service to the representatives of those official and voluntary health, medical, and social agencies in the New York City area who are interested in health education. The objectives of the Conferences have been stated as follows:

a. To evaluate critically the rôle of health education in present-day medicine and public health.

b. To define the rôle of such bodies as the New York Academy of Medicine in public health education.

c. To define the values and limitations of certain educational instrumentalities, including the radio.

Several of the principal addresses given at the 1940 Conference are now available in bound mimeographed form.

The addresses found in this publication include one by Alan Gregg, M.D., on the Function of Health Education in Present-Day Medicine with Special Regard to the Contributions of Physicians, Medical Schools, and Medical Organizations; one by Frank G. Boudreau, M.D., on The Function of Health Education in the Present-Day Practice of Public Health; and an untitled address by Henry F. Vaughan, Dr.P.H., dealing with the objectives of health education. A limited number of copies of this publication are available from the Academy, 2 East 103d Street, New York, N. Y. There is no charge for copies.

The 1941 Conference, held on November 18, included addresses by Edward J. Stieglitz, M.D., on The Rôle of Health Education in Present-Day Medicine (with special reference to its rôle in the promotion of well-being and in the retardation of degenerative diseases); an address by Edward L. Bernays on Psychological Barriers in Health Education, and an address by Allen Freeman, M.D., on Health Education by the Private Practitioners, the Voluntary Health Agency, and the Department of Health. Comments on the 1941 Conference will appear in a later issue of "Credit Lines."

Another notable and fundamental health education project of the New

York Academy of Medicine is the series of Lectures for the Laity. These lectures have for several years been given for the benefit of the general public. The 1941-1942 lectures began on November 13, with an address by James Alexander Miller, M.D., entitled "Tuberculosis: The Known and the Unknown." Other lectures in the series are scheduled as follows:

Thursday, December 11: Mechanisms of the Mind. Tracy Jackson Putnam, M.D.

Thursday, January 22: The Freudian Epoch. A. A. Brill, M.D.

Thursday, February 26: Creative Behavior in Child and Adult. Arnold Gesell, M.D.

Thursday, March 26: The History of Vitamin B. Norman Joliffe, M.D.

Thursday, April 23: The Newer Knowledge of Nutrition. A. J. Carlson, M.D.

(Note: Lectures are scheduled at 8:15 p.m.)

QUOTATION OF THE MONTH

"The mind can be ill-fed as well as the body. . . . Let us consider how many calories of truth we get, what protective vitamins can increase our resistance to propaganda, whence will come iron for the nation's blood stream. . . . What is a balanced ration for the mind? The science of nutrition tells folks how to better their laissez-faire eating. We might well do some research on laissez-faire thinking." Leon Whipple, September, 1941, *Survey-Graphic*

BOOKS AND REPORTS

A Symposium on Human Malaria
—*Publication of the American Association for the Advancement of Science No. 15. Edited by Forest Ray Moulton. Lancaster, Pa.: Science Press Printing Company, 1941. 398 pp. Price, \$5.00.*

This book is a symposium compiled from contributions by forty-two authorities in the field of malaria research and control. Contributors were selected by a joint committee from representatives of the Association for the Advancement of Science, the American Society of Parasitologists, the American Society of Tropical Medicine, and the National Malaria Committee. The contents are organized into eight sections with a very comprehensive bibliography.

The introductory section provides a brief history of malaria and there follow sections on: "parasitology," discussing the taxonomy and morphology of the principal American strains of *Plasmodium*; "anopheline vectors," including discussion of the morphology, distribution, bionomics, and ecology of *Anopheles* species of North America; "the epidemiology of malaria" as related to variations in prevalence, the influence of topography and related factors; "symptomatology," in which there is considerable detail regarding the clinical characteristics of infections and the influence of variables such as sporozoite dosage and race; "pathology and immunity," where considerable discussion is found relative to the cellular basis as opposed to the humoral nature of immunity in the disease; "treatment," which presents the broad characteristics of chemotherapy and devotes considerable attention to experimental methods for the study of chemotherapy; and the

final section which deals with control and potential eradication of the disease. Here there is presented in some detail the relative values of various methods used in control, including drainage, filling, larvicidal measures, and naturalistic control.

The question of housing with special reference to mosquito-proofing is discussed in one chapter while the management of water with particular reference to impounded water is covered by another.

Throughout the entire text of the volume, very considerable attention is devoted to the need for research. Despite the great amount of work done in recent years on this disease, there are yet many gaps in our knowledge; and, as the editor remarks, there are here indicated "many unexplored fields such as the production of culture media in which to grow and study the parasites, the development of vaccines and the synthesis of prophylactic drugs." As a whole, the symposium appears to accomplish the very necessary purposes of drawing together in brief compass the existing knowledge concerning malaria and its distribution in this region of the world and of pointing out fields in which knowledge must be extended by research before there is much opportunity for improvement in either the effectiveness or the economy of control. It is an eminently practical treatment of a very important disease and is recommended as a reference text for everyone who has either a direct or collateral interest in malaria. It should also be of particular value to public health administrators and to teachers of preventive medicine.

Taking the volume as a whole, the

editor does not overstate the case when he writes that the book represents "a systematic, comprehensive, authoritative and thoroughly documented discussion of the problems of human malaria in North America and the Caribbean region."

E. L. BISHOP

Nursing in Prevention and Control of Tuberculosis—By *H. W. Hetherington, M.D., and Fannie Eshleman, R.N.* Philadelphia: Putnams, 1941. 216 pp. Price, \$3.00.

From one of the outstanding centers of the United States for the study, treatment, and prevention of tuberculosis comes this textbook for nurses. The authors have recognized the need for all nurses to have a comprehensive knowledge of the diagnostic and therapeutic procedures involved in the prevention and control of tuberculosis. They have made many explanations regarding the disease and its diagnosis and treatment which heretofore have been only vaguely understood by the average nurse.

The authors are well prepared to write such a text and they have done an admirable piece of work. Both Dr. Hetherington and Miss Eshleman have had many years' experience in tuberculosis work. The book contains factual material, representing the best thinking of the nation's leaders in the tuberculosis field. Controversial issues are treated objectively and with an open-mindedness that will appeal to the reader. The book will prove of interest to the student nurse as well as to the sanatorium and the public health nurse. For classroom purposes, or for the individual interested in further study of this subject, the many references will provide a good source of material.

The text describes in detail the technics to be observed in the nursing care of the tuberculous and the nature of the nurse's service in the sanatorium, dispensary, or in the public health field

where she is rendering a family health service. The text contains numerous illustrations, including types of records, as well as description of the equipment and set-up necessary in many nursing procedures. These will be of considerable value to the nurses rendering services to the tuberculous, but who have had little or no special training in this field.

HELEN LE LACHEUR

Mobile Homes — A Study of Trailer Life—By *Donald Olen Cowgill.* Washington: American Council on Public Affairs, 1941. 127 pp. Price, \$2.00.

To one whose contact with trailers has been mainly through complaints of neighbors of a trailer parked for several days next door, this book is an eye opener. Instead of dealing largely with a group of transients who are living under makeshift conditions with poor sanitary facilities and conditions, an entirely new picture of trailerites as a group is presented.

The author who has traveled in his own trailer over a period of two years has summarized data collected from 131 trailer families. He recognizes the impossibility of getting a complete and accurate picture of the trailer population, but he has secured a representative sample of trailerites that one would meet in traveling about the country. This little book is packed full of tables which are discussed. Interest is added to the story by the inclusion of quotations from fellow trailerites on various questions under discussion in the report and by many personal observations. The author concludes that the majority of trailerites are stable and responsible individuals. The average income per family of this sample was \$254.49. Sixty-five per cent had completed a high school education and 21 per cent had finished college.

Practically all trailer dwellers are married and a very large proportion of

non-vacationist trailerites are retired couples and salesmen. Occupations that require frequent movement from place to place provide another large proportion of this group. There was an almost complete absence of unskilled laborers.

The reviewer feels after reading this report that a community with a sufficient number of trailer lots in well designed and constructed trailer camps would either find its problem solved, as the author seems to feel, or would have its trailer problem redefined in terms of two types of trailerites, those who are represented by the sample reported on and those who would not patronize well operated trailer camps.

This book should be read by all municipal administrators who are concerned with the control of trailers and trailer camps. ALFRED H. FLETCHER

Principles of Microbiology — By Francis E. Colien and Ethel J. Odegard. St. Louis: Mosby, 1941. 444 pp. Price, \$3.00.

This textbook is primarily intended for student nurses in the basic course of three years and for graduate nurses who are preparing for specialized positions. The authors state their intention "to present the subject so as to emphasize its application to the nursing sciences and disease prevention."

The authors have included material usually covered in general bacteriology as well as material on pathogenic protozoa and filterable viruses. In general the factual information regarding organisms is satisfactory, but the discussion of applied bacteriology in hospitals and public health laboratories is not. By attempting to give too much detail regarding laboratory work which cannot be covered properly in this type of text, the authors have given a good deal of erroneous information. The authors are apparently not well informed on present-day preventive medicine and its application to public health. In the chapter on

tuberculosis, the method given of interpreting Mantoux tests is not the one recognized as standard by the National Tuberculosis Association, and statistics given are 20 to 30 years behind the times. For example, "It is generally concluded that over 90 per cent of the people living in the cities of civilized countries have been infected with some form of tuberculosis before they reach adult life."

Discussion of the examination of food handlers gives the reader much misinformation. The authors state that the examination of milk handlers every six months should include throat and nose cultures for the detection of diphtheria carriers and tests for streptococci and venereal infection and assure that "physical examinations of this nature will aid greatly in the prevention of milk-borne infections." The statement is also made that "Persons in the communicable stages of syphilis should be prohibited from preparing or serving food to be consumed by others."

Again, the chapter on "Microbiology in relation to water" is very badly done. One might best dismiss the public health phase of the book by stating that most of the material given in the applied field of preventive medicine and public health is so incorrect and far behind the times that the book should not be recommended as a reference book for public health nurses. LUCY HEATHMAN

Social Case Records from Psychiatric Clinics — By Charlotte Towle, Chicago: University of Chicago Press, 1941. 455 pp. Price, \$3.00.

The author, who is Associate Professor of Psychiatric Social Work at the University of Chicago, states that this collection of case records was prepared primarily for use in her own classes. It will be interesting, however, to practising social workers and to others who have a knowledge of social case work as well as to teachers and students.

When used in the classroom the cases will be elaborated by interpretation of the meaning of the material presented and discussion of the methods of treatment. The individual reader will find the cases stimulating to his own diagnostic thinking. Because the book presents source material rather than the theory of psychiatric case work, Miss Towle's introduction is an unusually important and valuable section. Here she gives briefly, but with a clarity familiar to those who have been in her classes, her general philosophy and the principles of diagnostic thinking and treatment which are evidenced in the case material.

There are twelve case records given in narrative form and in considerable detail. The cases come from three different clinics and provide interesting variations in problems and methods. The recording is well done and strikes a satisfactory balance between lengthy but often unimportantly detailed reporting and the case summaries which are so condensed the reader finds difficulty in understanding the direction of treatment. Each case is followed by discussion notes designed to stimulate questions rather than to provide answers. A bibliography is also attached to each record and this with an excellent index should prove particularly helpful to the reader who is trying to enlarge his own understanding and perfect his methods of case work practice.

THEODATE H. SOULE

Lange's Handbook of Chemistry
—By N. A. Lange (4th ed.). Sandusky, Ohio: Handbook Publishers, 1941. 874 pp. Price, \$6.00.

This 4th edition, of which 271 pages are devoted to mathematical tables and formulas, is 8" x 5" in size and admirably bound for all purposes. An index, essential to a book of this type, is replete with references to the subject matter. New tables and extensions of old ones

have increased this edition in length by 85 pages. Eleven new tables are included and 15 have been increased in value by extensions or rewriting.

ARTHUR P. MILLER

Germes and the Man — By Justina Hill. New York: Putnam's, 1940. 461 pp. Price, \$3.75.

A unique feature of this latest attempt to popularize bacteriology is the inclusion of an extensive discussion of "the man"—131 pages devoted exclusively to a pathology and body defenses against infection. The bacterial enemy and the artificial aids to fighting him are discussed in another 257 pages.

It is a lively discussion, but much more so in some sections than others. The teacher of bacteriology, faced with a lecture room filled with sleepy students, may find it difficult to refrain from referring to "the 33 types of pneumococci which share a common protein antigen but differ in their frostings" or remembering the analysis of remaining "apart like grapes in fruit jelly" when he first tells his class of what solid media meant to bacteriology, or defining "anatoxin" as "toxin with its teeth pulled." But many, perhaps, will grow weary as they read on under the continuous bombardment of fancy phrases, such as "in that Ultima Thule of complete immunization," "that hot-bed of elegant curiosity, the Royal Society," "a botanist in this fold would be as out of place as a redwood in a miniature garden," "a bell jar, a nuisance in the laboratory if not in the neo-Victorian drawingroom."

Nevertheless, the story moves on. The history of laboratory and clinical achievements, chapters in modern epidemiology, or stories of famous personalities are woven into its fabric. Sometimes a subject is well reviewed as, for example, the history of disinfection (pp. 304-319); usually, however, small incidents are brought into

the picture in an informal and entertaining manner and do not detract from the essential story of the man's fight against infection down to 1940.

Included is much detail of recent advances in chemotherapy, even to the use of sulfanilylguanadine. One is, therefore, surprised that in so modern a book the significance of finding the virus of poliomyelitis in sewage, or the bactericidal properties of penicillin has been overlooked. Nevertheless, the popularizer of public health and bacteriology will probably keep a copy close at hand.

LEONA BAUMGARTNER

Effective Living—By C. E. Turner, Dr.P.H., and Elizabeth McHose. St. Louis: Mosby, 1941. 432 pp. Price, \$1.90.

For a long time we have needed a combined textbook and teacher's guide in health instruction at the secondary school level. The authors of this book have fulfilled such a need. The book is written in a simple style well adapted to high school students; methods of presentation are interesting; units of work are broad enough to suggest desired elaboration and the frequent illustrations (164) help to hold the reader's attention. The material has been tested in actual classroom situations and has been organized according to the reaction of students. Factual material is sound and "up to date."

This hygiene text is divided into three sections (instead of the conventional two sections, one on personal and one on community health). The second section touches on some of the health problems within the family group. These include such subjects as relationships of children and parents, children and their friends, problems of courtship and mating, maternal and infant health, and health problems of later years. The mental hygiene content in this section is prominent.

The third section, "Effective Living

in the Community," is especially appropriate. The senior author has crystallized his broad experience in public health teaching into a concise and simple presentation.

At the conclusion of each unit there is a "self checking" list for student self evaluation. There are also lists of problems and activities supplementing the text, and lists of references. Following the last unit there are listed the various sources of reference material. A plan is described whereby health material can be coordinated incidentally in the teaching of other high school subjects. Technical terms appear somewhat too frequently in the text, but these are defined in a glossary.

CHARLES E. SHEPARD

Laboratory Guide in Elementary Bacteriology—By M. S. Marshall. Philadelphia: Blakiston, 1941. 244 pp. Price, \$1.75.

This book is made up in an attractive and practical form, bound in imitation limp leather with a blank sheet opposite each exercise for class notes. The outline of the exercises is designed to catch the student's interest. Great emphasis is placed on the necessity of analyzing and understanding each experiment. A list of questions covering laboratory exercises, outside reading and lectures is given at the end of each section and should prove helpful and stimulating. The exercises are divided into six sections as follows: Introductory Technique, Morphology, Physiology, Applied Bacteriology, Serology, and Infection. These sections are followed by an appendix giving the apparatus, cultures, and other equipment needed to present the course.

The experiments as a whole are thoughtfully worked out and the sections are well organized. The experiments on the physiology of bacteria are especially good. The exercises under applied bacteriology are valuable as a

teaching tool, showing distribution of bacteria in milk, water, soil, etc., but in a general and elementary course the student scarcely has sufficient background to undertake really standard technics, nor are the exercises extensive enough to give him a sound idea of standard methods of milk and water analysis. The brief exercises in serology probably serve a purpose in helping the elementary student to grasp the idea of antigen-antibody reactions. They might be expanded profitably. The exercises on infection are well designed, but here again the reviewer feels they might be

expanded to include more groups of bacteria. There is a studious avoidance of the use of pathogens which leads to some limitation in the type of exercise possible. There is little apparent effort made to give the student an idea of the classification and identification of bacteria.

As a whole the book is excellent and the exercises, if carefully done and supplemented by adequate didactic work, would serve admirably to give the student a good basis on which to build his knowledge of bacteriology.

CORA M. DOWNS

BOOKS RECEIVED

- ADMINISTRATIVE MEDICINE—A LOOSELEAF PUBLICATION. Edited by Haven Emerson. New York: Nelson, 1941. 839 pp. Price, \$7.50.
- AN X-RAY ATLAS OF SILICOSIS. By Arthur J. Amor. Baltimore: Williams & Wilkins, 1941. 206 pp. Price, \$8.00.
- RHEUMATIC FEVER IN NEW HAVEN. Edited by John R. Paul. New York: Milbank Memorial Fund, 1941. 176 pp. Price, \$1.00.
- WE NEED VITAMINS. By Walter H. Eddy and G. G. Hawley. New York: Reinhold, 1941. 102 pp. Price, \$1.50.
- PROFESSIONAL DENTISTRY IN AMERICAN SOCIETY. By Alfred J. Asgis. New York: Clinical Press, 1941. 248 pp. Price, \$4.50.
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- IMMUNIZATION TO TYPHOID FEVER. From Research Laboratories of the Army Medical School, Washington, D. C. Baltimore: Johns Hopkins, 1941. 276 pp. Price, \$2.50.
- REFERENCE HANDBOOK FOR NURSES. By Amanda K. Beck and Lyla M. Olson. 9th ed. Philadelphia: Saunders, 1941. 347 pp. Price, \$1.60.
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- HANDBOOK FOR CIVILIAN DEFENSE. By Mayer-Daxlanden. New York: Civilian Advisory Service, 1941. 88 pp. Price, \$1.00.
- THE MODERN TREATMENT OF SYPHILIS. By Joseph Earle Moore. 2d ed. Springfield: Thomas, 1941. 674 pp. Price, \$7.00.
- WILLIAM HENRY WELCH AND THE HEROIC AGE OF AMERICAN MEDICINE. By Simon Flexner and James Thomas Flexner. New York: Viking Press, 1941. 539 pp. Price, \$3.75.
- NUTRITIONAL DEFICIENCIES. By Joseph B. Youmans. Philadelphia: Lippincott, 1941. 385 pp. Price, \$5.00.
- THE MICROBE'S CHALLENGE. By Frederick Eberson. Lancaster: Jacques Cattell Press, 1941. 354 pp. Price, \$3.50.
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- HOUSING FOR HEALTH. By the Committee on the Hygiene of Housing of the American Public Health Association. New Haven: The Committee, 1941. 221 pp. Price, \$1.00.
- TWELVE MONTHS OF HEALTH DEFENSE (1940 Annual Report). Edited by Savel Zimand. New York: Department of Health, 1941. 283 pp. Price, \$1.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

For Expectant Authors—If you hope some day to see a eulogistic note here about one of your scientific brain children, then read, ponder, and digest this excellent, but too brief, treatise on how to write it. Even if such a note about your contribution has already appeared here, this paper is still worth your while.

BAKELESS, J. The Technic of Technical Writing. *Am. J. Nurs.* 41, 10:1141 (Oct.), 1941.

Are Children Less Healthy Now-a-days?—School children in Hagerstown, Md., were absent from school more often during 1939–1940 than during the time of similar surveys made 5 and 20 years earlier. Girls were absent more often than boys and the increased absenteeism was allegedly due chiefly to colds and digestive disorders. Whether this was due to a greater incidence of these conditions or to our advice to mothers to take better care of the youngsters with minor illnesses is discussed. Perhaps you had better read the whole article to form your own conclusion.

CROCCO, C., *et al.* A Comparison of the Morbidity of Hagerstown, Maryland, School Children in 1921–1925, 1935–1936, and 1939–1940. *Milbank Quart.* 19, 4:375 (Oct.), 1941.

How to Say It—Brief but pointed is this list of some commonly mispronounced medical and scientific terms—words like syndrome, angina, nomenclature, and apparatus—words that you'll hear manhandled on any annual meeting program. Some Samaritan should extend this list to include the terrors in our public health vocabulary.

CLAGETT, A. H., JR. Pronunciation of Medical Terms. *J. A. M. A.* 117, 16:1377 (Oct. 18), 1941.

Why and How Often the Doctor Calls—From questions asked of a great many families it was found that the doctor made 4.2 calls per illness. How many visits were made for the various kinds of illnesses, how often a specialist was called for consultation, how many clinic visits, how many non-medical practitioners were summoned, and a lot of other useful information will be found here.

COLLINS, S. D. Doctor's Calls in Connection With Illness from Specific Diseases Among 9,000 Families, Based on Nation-wide Periodic Canvasses 1928–31. *Pub. Health Rep.* 56, 41:1941 (Oct. 10), 1941.

Mapharsen K O's Syphilis—Any method that will eliminate syphilis in at least 85 per cent of the early cases with 5 days of treatment is important to public health and warrants continued study in well organized centers. To this measured conclusion few will refuse to say Amen.

ELLIOTT, D. C., *et al.* An Evaluation of the Massive Dose Therapy of Early Syphilis. *J. A. M. A.* 117, 14:1160 (Oct. 4), 1941.

About Our Dietary Sins—Reviewing the whole subject of nutrition as it relates to national welfare, now and hereafter, this excellent summary is a highly useful work sheet from which the interested health worker may extend his reading to some of the 92 recent papers listed in the bibliography.

JEGHERS, H. Nutrition. *New Eng. J. Med.* 225, 18:687 (Oct. 30), 1941.

Epidemiologists Put Two and Two Together—The largest recorded epidemic of encephalitis has ended. Mosquitoes can transmit the disease, and mosquito infestation was heavy in the affected region. The disease was predominantly rural, and among the "field-hand" age groups. If mosquitoes are the vector there may be some reservoir other than man or horse. The prairie chicken is implicated.

LEAKE, J. P. Epidemic of Infectious Encephalitis (also)

Cox, H. R., *et al.* Isolation of Western Equine Encephalomyelitis Virus From a Naturally Infected Prairie Chicken. Pub. Health Rep. 56, 39:1902 (Sept. 26), 1941.

A Word to the Constipated—It seems that mineral oil is not the harmless, mild laxative we have assumed it to be. Health educators will do well to ponder upon this paper and the reported panel discussion that follows it. There the author admits he knows of no good laxative as he continues to express his opinion of mineral oil.

MORGAN, J. W. The Harmful Effects of Mineral Oil (Liquid Petrolatum) Purgatives. J. A. M. A. 117, 16:1335 (Oct. 18), 1941.

Wassermann Test Really Works—*News Item*—Reassuring indeed is this report upon the check-up of state laboratories performing the several standard diagnostic tests for syphilis. When the supervisory checks are extended to local laboratories, as they are in many states, then Doubting Thomases may well settle their gloomy forebodings about the Wassermann.

PARRAN, T., *et al.* Serodiagnostic Tests for Syphilis in State Laboratories. J. A. M. A. 117, 14:1167 (Oct. 4), 1941.

Those Much-Discussed Rejectees—Though rejections were higher in 1941 than in 1918 this does not mean that the physical status of young men has deteriorated, but the current crop of impairments that might have been

prevented by adequate public health programs does make it painfully evident that we should be doing more prophylactic work than we are.

PERROTT, G. St. J. Physical Status of Young Men, 1918 and 1941. Milbank Quart. 19, 4:337 (Oct.), 1941.

To Clarify Our Knowledge of Tuberculosis—Thirty-odd papers upon almost every conceivable aspect of industrial tuberculosis (and non-industrial, for that matter) are abstracted in this report of a symposium covering a full 5½ days of searching discussion by some recognized leaders in the field.

SAPPINGTON, C. O. Tuberculosis in Industry. Ind. Med. 10, 10:433 (Oct.), 1941.

No More You-Know-What by 1960?—One to four per cent of discharged tuberculous patients receive vocational rehabilitation. Half the discharged patients need it. Here lies the most neglected of the essentials to tuberculosis prevention.

SLITZBACH, L. E. Rehabilitation of the Tuberculous. Am. Rev. Tuberc. 44, 3:357 (Sept.), 1941.

For Tobacco Road—Better prenatal care in those parts of the South where birth rates are high, but income levels low, would tend to lower fertility rates, for the better the care that is devoted to each child, under the influence of rising standards, the fewer (and better) children the family is likely to have. The inference to this conclusion is so obvious it yells to high Heaven.

VANCE, R. B. The Regional Approach to the Study of High Fertility. Milbank Quart. 19, 4:356 (Oct.), 1941.

Our Neglected Mentally III—Any mother would take her problem child with less prejudice and hesitation to the health center where she had gone for immunizations and the like than to the outpatient department of an "insane

asylum." This is the nub of a telling plea for the inclusion of mental health in local health administrative programs.

VOGEL, V. H. Our Inadequate Treatment of the Mentally Ill as Compared with Treatment of Other Sick People. Pub. Health Rep. 56, 40:1941 (Oct. 3), 1941.

When Workers Wilt—Some of the signs of fatigue among Canadian industrial workers are briefly discussed. During the augmented war effort more and more people are attempting more than their capacity to perform will permit. Home guard duties and training are an important factor.

WARD, R. V. Chronic Fatigue Symptoms among Industrial Workers. Canadian Pub. Health J. 32, 9:464 (Sept.), 1941.

Games vs. Physical Training—England, experiencing a grim test of physical fitness, is paying the penalty of long neglect of communal sports centers directed by men with a genius for making people want to play. Setting-up exercises, no matter how rigorously drilled, will never be a substitute, thinks this British military man.

WEBSTER, F. A. M. Athletics in Relation to National Fitness. J. Roy. Inst. Pub. Health & Hyg. 4, 10:241 (Oct.), 1941.

ASSOCIATION NEWS

Allen W. Freeman, M.D. President-Elect

DR. ALLEN WEIR FREEMAN, of Baltimore, Md., was chosen President-Elect at the 70th Annual Meeting of the Association in Atlantic City, N. J., in October. Dr. John L. Rice, of New York City, was inducted into office as President, and Dr. W. S. Leathers, of Nashville, Tenn., retired as President.



ALLEN W. FREEMAN, M.D.

Dr. Freeman was born in Lynchburg, Va. on January 7, 1881. He took his baccalaureate degree at Richmond College, and his M.D. degree at the Johns Hopkins University in 1905. After completing his internship at Newark (N. J.) City Hospital, he became a demonstrator in physiology at the Medical College of Virginia, and a year later

joined the staff of the Richmond Health Department as Medical Inspector. He became Assistant Commissioner of Health in Virginia in 1908, which position he occupied until 1915. He was State Director of the Rockefeller Hookworm Commission for Virginia from 1910 to 1914. From 1915 to 1917 he served the United States Public Health Service as epidemiologist and was appointed Commissioner of Health for the State of Ohio in 1917, serving in this post until 1921. His career at Johns Hopkins University began in the same year with a resident lectureship in public health administration. In 1923 he became Professor of Public Health Administration, which position he still occupies. Dr. Freeman served as Dean of the School of Hygiene and Public Health from 1934 to 1937. As a Major in the Medical Corps of the United States Army in 1918 he investigated pneumonia in Army camps among other epidemiological studies. In 1926 he was made a special member of the Rockefeller Foundation Staff and lectured at the University of Rio de Janeiro. Dr. Freeman is a Fellow of the American Public Health Association, and of the American Academy of Public Health, and a member of the American Medical Association and of the Medical Society of Virginia.

So ends the historical story. Dr. Freeman in all of his activities, however, has been a teacher, and his influence on the rising generation of public health administrators is outstanding, as all the world knows.

Sedgwick Memorial Medal for 1941 Awarded to Dr. Charles Armstrong

DR. ARMSTRONG, twelfth recipient of the Sedgwick Memorial Medal, was born in Alliance, Ohio, on September 25, 1886. He was graduated from Mt. Union College in 1910, and took his M.D. degree at Johns Hopkins in 1915. The degree of Doctor of Science was conferred upon him by Mt. Union College in 1933. He has been an officer of the United States Public Health Service since the completion of his internship in 1916—assistant surgeon, passed assistant surgeon, surgeon, and senior surgeon. He is now an investigator for the National Institute of Health. His researches have been many and notable, including research in botulism, influenza, syphilis, tetanus following vaccination, milk-borne epidemics, dengue, encephalitis, psittacosis, poliomyelitis, and choriomeningitis.

The award was made on October 14, 1941, during the 70th Annual Meeting at Atlantic City, by Thomas Parran, M.D., Chairman of the Sedgwick Memorial Medal Committee. Dr. Parran in presenting the medal said:

"The Committee on the Award of the Sedgwick Memorial Medal, composed of the last five living recipients of this award, has the very great privilege of presenting the Sedgwick Memorial Medal for 1941 to Dr. Charles Armstrong of the National Institute of Health, Washington, D. C.

"At the old Hygienic Laboratory in Washington, more than a decade ago, a group of scientists was engaged in conversation of a somewhat desultory nature; the discussion drifted to the aims, ambitions, and lodestars of men and of scientists in particular. The oldest member of the group, shortly afterward claimed by death, was Joseph

Goldberger. He was asked what he himself would value above all else as a reward for his achievements; his reply was 'the esteem and good wishes of my colleagues.'



CHARLES ARMSTRONG, M.D.

"To a greater or less degree we are familiar with research work in the field of human diseases but comparatively few of the workers in this field are personally known to any one of us. It has been my good fortune to know a few of these men well, and one in particular I have known for almost a quarter of a century. I have followed his outstanding work on botulism, tetanus, dengue, influenza, psittacosis, encephalitis, choriomeningitis, and poliomyelitis. He is unique in that he has made a distinct contribution to our knowledge of every disease with which he has worked. I know his adequate preparation, his careful procedure, and

his rigid criticism of his own work; I know him also as an essentially human person, very modest, thoroughly kind, completely unselfish, and of unfailing equanimity.

"Your scientific achievements, Dr. Armstrong, have won for you a place in the front rank of investigators and your personal qualities endear you to

scientist and layman alike—to all who seek after truth.

"The members of the Association take a great deal of pleasure in awarding to you—for distinguished service in public health—the Sedgwick Memorial Medal for 1941 as a physical token of 'the esteem and good wishes of your colleagues.'"

GRANTING OF HONORARY MEMBERSHIPS TO VISITORS FROM LATIN AMERICAN COUNTRIES

AT THE Atlantic City Annual Meeting the A.P.H.A. bestowed honorary membership for one year on each of the following distinguished visitors from Latin America:

Argentina—Dr. Hugo D'Amato, Secretary of the National Department of Health

Bolivia—Dr. Abelardo Ibáñez Benavente, Minister of Public Health; Dr. F. Torres-Bracamonte, Member of the Ministry of Public Health

Brazil—Dr. Teófilo Almeida, Director, Federal Hospital Division, National Department of Health

Chile—Dr. Salvador Allende, Minister of Health and Social Welfare; Dr. José Vizcarra, Manager, Valparaíso Branch, Social Security Service

Colombia—Dr. Roberto Franco, Counselor of Colombian Embassy; Dr. J. Aristizábal, Professor of Medicine, Medellín University

Cuba—Dr. Félix Hurtado, Undersecretary of Health; Dr. E. Saladrigas, Director, Finlay Institute; Dr. Mario LeRoy, Secretary, Finlay Institute.

Dominican Republic—Dr. Wenceslao Medrano, Minister of Health and Social Welfare; Dr. L. F. Thomen, Member of the Ministry of Health and Social Welfare

Ecuador—Dr. J. A. Montalván, Assistant Director of Health

El Salvador—Dr. Victor Sutter, National Director of Health

Guatemala—Dr. C. Estévez, Director General of Public Health

Haiti—Dr. Rulx Léon, Former Undersecretary of Public Health

Honduras—Dr. Pedro H. Ordóñez Díaz, National Director of Public Health

Mexico—Dr. Joaquín Astorga, Chief of the Rural Hygiene Office

Nicaragua—Dr. Louis M. Debayle, National Director of Public Health

Paraguay—Dr. Raúl Peña, Director of Public Health

Peru—Dr. J. A. Estrella Ruiz, Director of Public Health

Uruguay—Dr. J. C. Mussio Fournier, Minister of Public Health

Venezuela—Dr. A. Castillo Plaza, Director of Public Health

Other official delegates from Latin American countries who attended the meeting and who are already affiliated with the Association are as follows:

Chile—Dr. Rigoberto Rios Castro, Chief of Health Education

Colombia—Dr. J. A. Montoya, Member, National Institute of Health

Cuba—Dr. Domingo F. Ramos, Minister of National Defense; Dr. Carlos E. Finlay, Director of Public Health

Mexico—Dr. Mario Quiñones, Secretary of the Department of Health; Dr. Angel de la Garza Brito, Director of the School of Public Health; Dr. Gustavo A. Uruchurtu, Chief of the Office of Health Education

Puerto Rico—Dr. Eduardo Garrido-Morales, Commissioner of Public Health, and Vice-President, American Public Health Association

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Placido Arrache, M.D., Lares, Puerto Rico, Chief, Public Health Unit
 William C. Buss, M.D., C.P.H., 2018 Quincy St., Bakersfield, Calif., Director, Communicable Disease Control, Kern County Health Dept.
 Francis A. Campana, M.D., 615 17th St., Union City, N. J., Health Officer
 Jerauld A. Campbell, M.D., Brooksville, Ky., Health Officer, Bracken County Board of Health
 William J. Craig, M.D., Moulton, Ala., Lawrence County Health Officer
 Dr. Domingo A. Crescioni, San German, Mayaguez, Puerto Rico, Medical Officer, Public Health Unit
 Charles Turner Foulk, 2nd, Health Dept., Bloomfield, N. J., Health Officer
 Merritt L. Gentry, M.D., M.P.H., State Board of Health, Jefferson City, Mo., Director, Div. of Child Hygiene.
 Beryl A. Ingalls, M.D., 4212 Joliet Ave., Lyons, Ill., Health Commissioner and School Physician
 Dr. Juan R. Laugier, P. O. Box 845, Ave. San Jose 26, Rio Piedras, Puerto Rico, Health Officer, Public Health Unit
 Robert F. Morgan, 50 Shanley Ave., Newark, N. J., 2nd Assistant Health Officer, Newark Health Dept.
 Eduardo R. Perez-Mir, M.D., Hostos St., Guayama, Puerto Rico, Medical Officer in Charge, Venereal Diseases Div.
 Marvin Ransdell, M.D., M.S.P.H., Prestonsburg, Ky., Director, Floyd County Health Dept.
 Ramon A. Rios-Algarin, M.D., Public Health Unit, Humacao, Puerto Rico, Chief Medical Officer
 Dr. Manuel Roman-Benitez, Public Health Unit, Fajardo, Puerto Rico, Medical Officer
 Jacob Rosenwasser, M.D., 602 N. Main St., Mishawaka, Ind., Secretary, Mishawaka Health Board
 Edwin F. Stewart, M.D., 94 Fair Haven Rd., Fair Haven, N. J., Health Officer
 James Stewart, M.D., State Office Bldg., Jefferson City, Mo., State Health Commissioner
 Lyman H. Wheeler, M.D., 23 Orchard St., Lockport, N. Y., Health Officer, Lockport City & Town Board of Health

Paul A. Wright, M.D., Jackson, Ky., Breathitt County Health Officer

Laboratory Section

Lois Almon, Ph.D., State Laboratory of Hygiene, Madison, Wis., Coördinating Bacteriologist
 Lillian Buxbaum, M.A., 10 Monroe St., New York, N. Y., Assistant Bacteriologist, New York City Dept. of Hospitals
 William Arnold Dorsey, A.B., P. O. Box 151, Arlington, Va., Arlington County Bacteriologist
 Albert Ehrlich, B.S., 10 Monroe St., New York, N. Y., Junior Bacteriologist (Clinic), Dept. of Health
 Florence K. Fitzpatrick, M.A., Sharp & Dohme Inc., Glenolden, Pa., Research Bacteriologist
 Oscar B. Hunter, M.D., 1835 Eye St., N.W., Washington, D. C., Professorial Lecturer in Sanitary Science, Central Training School for Nurses
 Harald N. Johnson, M.D., 111 College St., Montgomery, Ala., Assistant Director, Rabies Study, State Board of Health
 Neil T. Mahony, X-Ray Dept., St. Mary's Hospital, Tucson, Ariz.
 James J. Moran, Landis Ave. & Spring Rd., Vineland, N. J., Technical Manager, Sales Dept., Kimble Glass Co.
 J. Howard Mueller, Ph.D., Harvard Medical School, 25 Shattuck St., Boston, Mass., Associate Professor of Bacteriology & Immunology
 Henry Simon, M.D., 5 Vermont Ave., Newark, N. J., Physician in Charge, Respiratory Bureau, Newark City Health Dept.
 Arthur M. Slee, Stroudsburg, Pa., Director, Biological Laboratory, National Drug Co.
 C. Wilbur Stewart, M.D., Maryland General Hospital, Linden Ave., & Madison St., Baltimore, Md., Pathologist
 Ona Ruth Whitley, M.S., 1000 Wadesboro Ave., Monroe, N. C.
 Joseph Zichis, Ph.D., 1800 W. Fillmore, Chicago, Ill., Research Biochemist and Bacteriologist, State Health Dept.

Vital Statistics Section

Margaret Anderson, B.A., 8650 Goethe Ave., Detroit, Mich., Student, Univ. of Michigan
 Morton Kramer, D.Sc., Insular Dept. of

Health, Santurce, Puerto Rico, Statistician, Insular Dept. of Health, and Assistant Professor of Biostatistics, School of Tropical Medicine

Clyde F. Ross, L.L.B., State Health Dept., Oklahoma City, Okla., Director of Vital Statistics

Antoine Valois, M.D., 4215 Mary Ave., Baltimore, Md., Medical School Inspector, Montreal City Health Dept.

Engineering Section

Harold S. Adams, City Health Dept., Flint, Mich., Director, Division of Food and Sanitation

William R. Benford, M.S., 17 Observatory Ave., North Providence, R. I., Assistant Professor of Civil Engineering, Brown Univ.

Fred S. Gibbs, 346-A Newbury St., Boston, Mass., Sanitary Engineer, Wallace & Tiernan Co., Inc.

Ralph C. Graber, B.S., 774 Butternut St., Abilene, Tex., Junior Public Health Engineer, U. S. Public Health Service

Alexander Hulsebosch, 25 Boulevard, Westwood, N. J.

Frank W. Lister, C.E., P. O. Box 2039, Ancon, Canal Zone, Chief Technical Engineer, War Dept.

Arvel G. Owens, Hergott St., Ruston, La., Regional Sanitarian, Div. of Local Health Service, State Dept. of Health

Nelson H. Rector, C.E., 730 South Prentiss, Jackson, Miss., Assistant State Director, State Board of Health

Theodore F. Wisniewski, B.S., 409 East Walnut St., Green Bay, Wis., Assistant Sanitary Engineer, State Board of Health

Industrial Hygiene Section

Horace C. Dudley, Ph.D., National Institute of Health, Bethesda, Md., Toxicologist, Industrial Hygiene Div.

Kenneth N. Fluckey, B.S., 2002 Acton St., Berkeley, Calif., Engineer, Industrial Hygiene Service, State Dept of Public Health

William Franklin, M.S., 23 Joy St., Boston, Mass., Junior Public Health Engineer, Div of Industrial Hygiene, U. S. Public Health Service

Arthur H. Krause, B.S., 821 E. 49th St., Chicago, Ill., Chemical Engineer, State Dept. of Public Health

George D. Reed, C.E., 6 Beargrass Ave., Buechel, Ky., Assistant Sanitary Engineer, State Dept. of Health

Abraham Wallach, C.E., Room 329, Municipal Court Bldg., St. Louis, Mo., Junior Public Health Engineer, U. S. Public Health Service

Food and Nutrition Section

Herbert O. Calvery, Ph.D., 5165 S. Agriculture Bldg., Food & Drug Admin., Washington, D. C., Chief, Div. of Pharmacology

William G. Walter, M.S., N. Y. State Experiment Station, Geneva, N. Y., Assistant in Research

Logan T. Wilson, Ph.D., Walker-Gordon Laboratory Co. Inc., Plainsboro, N. J., Laboratory Director

Maternal and Child Health Section

Thomas W. Kirmse, M.D., New York Univ. Med. College, 477 1st Ave., New York, N. Y., Instructor, Dept. of Preventive Medicine

F. Carrington Owen, M.A., Box 251, Tryon, N. C., Staff Nurse-Midwife, Rutherford-Polk Health Dist.

Ruth A. Rothmayer, R.N., 9434 Park Lane South, Woodhaven, L. I., N. Y., Supervising Nurse, New York City Dept. of Health

Public Health Education

Ernest R. Bryan, M.A., U. S. P. H. S., 19th & Constitution Ave., Washington, D. C., In-Charge, Radio, Motion Picture and Publication Section, Div. of Sanitary Reports and Statistics

Ann Laws Calley, 33 Pearl St., Pittsfield, Mass., Executive Director, Community Cupboard

Adelaide H. Davidson, A.B., 777 High St., Newark, N. J., State Health Administrative Officer, National Youth Admin.

Arthur F. Davis, Dr.P.H., 610 West Beaver St., State College, Pa., Associate Professor of Physical & Health Education, Pennsylvania State College.

Inez Driskell, Box 1963, Jackson, Miss., State Health Director, National Youth Admin.

Elva Horner Evans, R.N., M.A., 2155 N. Taylor Rd., East Cleveland, Ohio, Instructor, Family Health Association

Marie Goulett, Ph.B., 105 E. 22nd St., New York, N. Y., Field Secretary, N. Y. Committee on Tuberculosis and Public Health, State Charities Aid Assn.

Eleanor Hassell, M.P.H., 631 N. President St., Jackson, Miss., Supervisor of Health Education, State Board of Health

H. F. Kilander, Ph.D., Panzer College, East Orange, N. J., Dean & Professor of Health Education

Anita D. Laton, Ph.D., Teachers College, Columbia Univ., New York, N. Y.

A. Helen Martikainen, M.P.H., 65 Wethersfield Ave., Hartford, Conn., Health Education Secretary, Hartford Tuberculosis and Public Health Society

- Kenneth R. Miller, 412 Woodcliffe Rd., Upper Darby, Pa., Health Education Secretary, Philadelphia Tuberculosis and Health Assn.
- Ann B. Morse, 222 Cabot St., Beverly, Mass., Health Educational Secretary, Essex County Health Assn.
- S. Douglas Polhemus, M.A., 260 Laurel St., Hartford, Conn., General Secretary, Hartford Tuberculosis and Public Health Society
- Paul F. Rector, B.S., 229 W. McCarty, Jefferson City, Mo., Director, Public Health Education, State Board of Health
- Ketty Rivera-Rodriguez, B.A., Vizcarrondo, 2, Caguas, Puerto Rico., Field Agent, Venereal Diseases Clinic
- Mary B. Russell, R.N., B.S., Window Rock, Ariz., Field Nurse, U. S. Indian Service
- Dorothy Rutherford, B.S., 140 Clarendon St., Boston, Mass., Health Educator, Y.W.C.A.
- Irving Shapiro, B.S., 936 Lancaster Ave., Syracuse, N. Y., Director of Community Health Education, Onondaga Health Assn.
- Helen E. Watkins, B.S., 44 West Main, Middletown, N. Y., Executive Secretary, Orange County Health Assn.
- Elmer W. Weber, Ed.D., 438 W. 116th St., Apt. 1, New York, N. Y., Director of School Health, Evansville Public Schools
- Arthur Weissman, B.A., 3811 Van Ness St., N.W., Washington, D. C., Research Worker in Health Education, U. S. Public Health Service
- Enid Williams, B.S., 379 West 127th St., New York, N. Y., Staff Nurse, Dept. of Health
- Camilla L. Wills, M.A., 82 Arnold Ave., Amsterdam, N. Y., Health Teaching Supervisor, N. Y. State Dept. of Education
- Jay T. Wright, M.A., Trinity School, Athens, Ala.
- Public Health Nursing Section*
- Evelyn S. Allnutt, R.N., Poolesville, Md., Public Health Nurse, Montgomery County Health Dept.
- Margaret A. Barnett, R.N., Board of Health, Hilo, Hawaii, Public Health Nurse
- Adaline Chase, M.A., Bennett Hall, Univ. of Pa., Philadelphia, Pa., Assistant Professor, Dept. of Nursing Education
- Mary C. Creagh, B.S., 416 Broad St., Salamanca, N. Y., Public Health Nurse, U. S. Public Health Service
- Maria M. Cruz-Alvarez, Cristobal Colon St., 12, Arecibo, Puerto Rico., Public Health Nurse, Public Health Unit
- Marie Dandridge, 2029 St. Paul St., Baltimore, Md., Supervisor of Field Nurses, Baltimore, City Health Dept.
- Catherine E. Denning, 399 Mimcring Rd., Clintonville, Columbus, Ohio, Industrial Hygiene and Nursing Consultant, State Dept. of Health
- Margaret E. Dizney, R.N., Dist. Health Center, Dover-Foxcroft, Me., Supervisor and Educational Director, Maine Bureau of Health
- Catharine Eyster, B.S., 1431 Virginia Park, Detroit, Mich., Staff Nurse, Visiting Nurse Assn.
- Esther M. Finley, R.N., M.A., 68 Laurel Ave., Avon-by-the-Sea, N. J., Supervising Nurse, State Health Dept.
- Helen L. Fisk, B.S., R.N., 132 East 45th St., New York, N. Y., Director, Out-Patient and Field Service, Margaret Hague Maternity Hospital
- Helen M. Giles, B. S., 40 Sanford Place, Bridgeport, Conn., Public Health Nursing Consultant, State Health Dept.
- Hortense E. Gruber, 571 Benson St., Camden, N. J., Local Field Supervisor, Nursing Service, Metropolitan Life Insurance Co.
- Mildred E. Halvorsen, R.N., Court House, Freeport, Ill., Stephenson County School Nurse
- Elizabeth Howell, B.S., 629 Winters St., West Palm Beach, Fla., School Nurse, Board of Public Instruction
- Helen M. Howell, M.A., Vandervilt Univ., Nashville, Tenn., Associate Professor, Public Health Nursing
- Ella Alethea Hunt, 37 Central Ave., Waterbury, Conn., Supervisor, Waterbury Visiting Nurse Assn.
- Marie J. Isselstein, M.A., 405 N. 8th St., Opelika, Ala., Advisory Nurse, East Alabama Health District
- Marguerite C. Libby, R.N., 1501 California Ave., St. Cloud, Fla., Supervisor of Nurses, Orange County Health Unit
- Mabelle J. Markee, M.S.P.H., Brown Hotel, Des Moines, Ia., Educational Director, Public Health Nursing Assn.
- Edna B. Miller, 707 W. 180th St., New York, N. Y., Nurse, Dept. of Health
- Mary C. Mulvany, B.S., 768 Bushwick Ave., Brooklyn, N. Y., Assistant Professor of Public Health Nursing, St. Johns Univ.
- Catherine V. Nardi, R.N., B.S., 1225 Park Ave., Williamsport, Pa., Nursing Consultant, American National Red Cross
- Evelyn C. Nelson, 224 East Cass St., Cadillac, Mich., Supervising Nurse, Wexford County Health Unit
- Alice G. Nicolle, B.S., R.N., 228 S. 44th St., Philadelphia, Pa., Supervisor of Public Health Nursing, Dept of Health, St. Catharines, Ont., Canada
- Ethelle Reeves. Fordyce, Ark., Public Health Nurse, State Board of Health

Opal L. Regan, 1319 23rd Ave., Meridian, Miss., Supervising Nurse, Lauderdale County Health Dept.

Elizabeth Schweikert, 2794 Tivoli Ave., Baltimore, Md., Assistant Supervisor, Public Health Nursing, Eastern Health Dist.

Elizabeth L. Sewell, R.N., B.S., 411 Herald Bldg., Syracuse, N. Y., Consultant Public Health Nurse, State Dept. of Health

Mabel H. Shonley, 85-43 104th St., Richmond Hill, L. I., N. Y., Assistant Supervisor, Brooklyn Visiting Nurse Assn.

Ruth Tighe, 4712 Oliver St., Riverdale, Md., County Public Health Nurse

Madeline B. Turner, 1573 Broadway, Denver, Colo., Regional Consultant, Public Health Nursing, New Mexico State Dept. of Public Health

Elizabeth Ulmer, M.A., 201 Federal Bldg., Superior, Wis., Field Nurse, American Red Cross

Johanna R. Vreeland, M.A., 2475 N. W. Westover Rd., Portland, Ore., Educational Director, College of Nursing, Univ. of Portland

Margaret C. Wohlgemuth, 1411 West St., Annapolis, Md., Supervisor of Nurses, Anne Arundel County Health Dept.

Epidemiology Section

Dorothy Donnelly-Wood, M.D., M.P.H., 2035 Walnut St., Philadelphia, Pa., Immunologist, Dept. of Health

Joseph Duplessis, M.D., 2107 Chelsea Terrace, Baltimore, Md., Epidemiologist, City Health Dept., Montreal, Que., Canada

Grant O. Favorite, M.D., 1313 Andover Rd., Overbrook, Philadelphia, Pa., Dept. of Preventive Medicine & Public Health, Hahnemann Medical College

Julia MacPhillips, 314 State St., Albany, N. Y., Consultant Public Health Nurse, State Dept. of Health

Gilbert F. Otto, Sc.D., 615 N. Wolfe St., Baltimore, Md., Assistant Dean, School of Hygiene and Public Health, Johns Hopkins Univ.

Unaffiliated

Charles P. I. Bergholdt, M.S.P.H., 305 City Hall, Omaha, Nebr., Sanitarian, Omaha-Douglas County Health Unit

Iva W. Holmes, County Bldg., Johnstown, N. Y., Executive Secretary, Fulton County Tuberculosis and Public Health Assn.

William F. Hunting, M.D., Box 61A, R. R. 6 Amberley, Lockland Station, Cincinnati, Ohio, Director of School Hygiene and Health, Board of Education

Martin M. Kaplan, V.M.D., 5919 York Rd., Philadelphia, Pa., Student, Univ. of Pa.

John A. Louis, M.A., 1575 Neil Ave., Columbus, Ohio, Assistant Secretary, Ohio Public Health Assn.

Edwin E. McNeil, M.D., The Queen's Hospital, Honolulu, Hawaii, Director, Bureau of Mental Hygiene and the Mental Hygiene Clinic

Manuel Perez-Torres, B.S., 30 Tapia, Stop 44, Santurce, Puerto Rico, Entomologist, Dept. of Health

Dr. Pie Rechani-Rodrigo, Unidad Salud Publica, Caguas, Puerto Rico, Food and Drug Inspector, Div. of Pharmacy

Wilson T. Sowder, M.D., M.P.H., City Health Dept., Tampa, Fla., P. A. Surgeon, U. S. Public Health Service

Nancy Mac Warren, M.A., 620 South Third, Louisville, Ky., Record Technician, State Dept. of Health

DECEASED MEMBERS

Joseph E. Pollard, M.D., Newark, N. J., Elected Member 1924

Charles J. Whalen, M.D., Chicago, Ill., Elected Member 1910

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearing house on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

UNASSEMBLED EXAMINATIONS IN WEST VIRGINIA

The Merit System Council of West Virginia, Box 873, Morgantown, has announced that it is expected that unassembled examinations will shortly be given for the following positions in the West Virginia State Health Department.

Position	Salary per month
Chief of Medical Services.....	\$325-\$400
Ophthalmologist	275- 350
Director of County Health Work.....	350- 400
Director, Maternal & Child Hygiene.....	350- 400
Director, Communicable Diseases	350- 400
Director, Vital Statistics	350- 400
Director, Industrial Hygiene	350- 400
Assistant Director, Maternal & Child Hygiene.....	320- 375
Assistant Director, Communicable Diseases (Venereal).....	320- 375
Assistant Director, Tuberculosis	320- 375
Venereal Disease Consultant	320- 375
Senior Health Officer	320- 375
Junior Health Officer	280- 320
Health Officer Trainee	\$200

Residence in West Virginia has been waived in consideration of the applications for these positions. However, residents of the state may be given preference in making appointments. Complete information may be obtained by writing to the Merit System Council.

VACANCY IN LOS ANGELES CITY HEALTH OFFICER POSITION

The City of Los Angeles is seeking qualified applicants for the position of City Health Officer paying a salary of \$7,200 per annum. While the city charter requires that candidates for this position be residents of the City of Los Angeles if possible, if insufficient competition for this examination is obtained, candidates who do not reside in the city may become eligible if they are otherwise qualified. From the experience of other agencies in this area it is probable that insufficient competition will be obtained and that it will be necessary to waive the residence requirements.

The City Health Officer is the Chief Administrative Officer of the City Health Department and plans and administers a broad public health program, including medical and inspectional services. He is responsible for the proper enforcement of health laws and ordinances and the prevention and control of communicable disease in the city.

Public health physicians who are interested in this position should communicate with the Los Angeles City Civil Service Commission, Room 11, City Hall, Los Angeles, California, for further information.

U. S. CIVIL SERVICE COMMISSION

The Commission has announced that applications will be received for positions as Senior Medical Officer (\$4,600), Medical Officer (\$3,800), and Associate Medical Officer (\$3,200) for appointments in the Public Health Service, with the Food and Drug Administration, Veterans' Administration, and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington.

Junior Public Health Nurse. A civil service examination for Public Health Nurse (\$2,000) has been open for some time. Nurses who have been unable to qualify for

this examination because of the experience requirement now have an opportunity to qualify through a new Junior Public Health Nurse examination (\$1,800) which requires no experience. Applications are also being received for examinations now open for Junior Graduate Nurse (\$1,620) and Graduate Nurse for general staff duty (\$1,800). Further information and application forms may be obtained at any first or second class post office or from the Civil Service Commission, Washington.

POSITIONS AVAILABLE

Young woman, trained in Home Economics, for group contact work in behalf of an important commercial organization whose products are useful in the protection of public health and the National Nutrition Program. Experience in the public health field or related fields is essential. Office in New York, some travel involved. Write Box H, Employment Service, A.P.H.A.

Southern State Department of Health seeks physicians qualified by training and experience as County Health Officers or as Pediatricians. Write Box B, Employment Service, A.P.H.A.

Western State Department of Health will consider applications from physicians with experience and a degree in public health. Write Box S, Employment Service, A.P.H.A.

Physician with public health training to serve as full-time County Health Officer in rural South Atlantic area. Salary \$3,600 to \$4,000. Write Box C, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have four months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

Physician with either public health training or experience in local health department administration to serve as health director in a county health department in mid-western state. Salary \$4,000 and \$500 travel (flat rate). Well established department with offices in attractive little city of 10,000. Write Box T, Employment Service, A.P.H.A.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expense, increase to \$1,700 within 6 months. Saginaw County Health Department, Saginaw, Mich.

The State Department of Social Security and Welfare, Crippled Children's Division, of Phoenix, Ariz., has three vacancies to be filled. Examinations will soon be held for orthopedic nursing consultant, nurse-physical therapist, and medical social worker.

Further information may be obtained by writing to the Merit System Supervisor, Room 208, 128 North First Avenue, Phoenix, Arizona.

PHYSICIANS WANTED IN CINCINNATI

Carl A. Wilzbach, M.D., Commissioner of Health of Cincinnati, has announced that there are vacancies for white male physicians, aged 23 to 50, graduates of recognized colleges of medicine, licensed to practise in Ohio, for appointment to the Cincinnati Health Department. Duties include surveillance over communicable disease, infant and child welfare work, medical service for sick poor, epidemiological surveys of communicable disease, examinations for work certificates, school teachers, etc., vaccination, medical school inspection. Salary \$2,640 to \$3,360 plus transportation allowance of \$240 per annum. Eligible for a retirement system. Persons interested should communicate with Dr. Wilzbach, Commissioner of Health, City Hall, Cincinnati, Ohio.

POSITIONS WANTED

ADMINISTRATIVE

Physician, M.D. Tnlane, M.P.H. Johns Hopkins, age 31, experienced as health unit director, prefers administrative position in the South. A-488

Physician with M.P.H. from Johns Hopkins 1924, experienced as state director for communicable diseases, as county health officer and as director of field training center, will consider responsible position with good income. A-483

Physician, age 35, with Dr.P.H. from Harvard and experienced in administrative tuberculosis control will consider a good administration position. A-476

HEALTH EDUCATION

Teacher and research worker, man, Ph.D., age 52. Extensive record as college professor of biology and hygiene and investigator, for the past two years engaged in research. H-499

Woman with M.S. in public health, University of Michigan, and Ph.D. in health education, New York University, experienced in public schools, teachers colleges, and community public health, now employed as health teaching supervisor, will consider position in school, organization, or industry. H-236

Young woman with Master's degree in Health Education, Teacher's College, Columbia University, and background of clinical laboratory work and biochemistry, seeks position as health educator in research or as laboratory assistant in public health. H-494

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. H-497

Woman, M.S. in public health, excellent graduate training in education, 8 years' experience as business executive (sales and publicity). Just completed year's research in community education. Seeks good administrative position. H-496

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

Health Educator. Man with M.S. in preventive medicine and public health. Negro. Seeks position in Health Education or field work with official or non-official agency. H-500

LABORATORY

Milk Sanitarian and Technologist, age 37, Ph.D. Bacteriology, Wisconsin, 10 years' experience in milk and food sanitation from industrial and official angle, seeks administrative position with opportunity for research or investigational work preferred. L-381

Experienced Bacteriologist, man, 56, with long record as successful university teacher, research worker, and head of department of bacteriology and public health, desires new location in educational, research, or public health organization. Available at once. L-462

Experienced woman bacteriologist, now

employed, graduate Iowa State College 1925, 6 months on Fellowship at Johns Hopkins 1930, wishes position in serology, immunology, bacteriology or research. L-458

Experienced laboratory technician. Woman with 17 years in large midwest municipal laboratory. Has 12 years' background in the Kahn test. Excellent references. Immediately available. Will consider any location. L-460

Chemist, Sc.D., Biochemistry, Johns Hopkins University. Age 31. Public health laboratory experience, teaching experience. Desires position with promise of advancement, preferably in commercial organization. L-461

Pharmacologist. A.B. Johns Hopkins, Ph.D. Maryland 1941. Desires position in public health work. Minors, medicinal and physical chemistry, research experience with sulfanilamide and Vitamin C. Training in bioassay. Publications. Age 29. L-463

SANITARY ENGINEERING

Engineer, age 38, 3 years' experience as district sanitary supervisor, state department of health, together with work on plumbing, heating and ventilation. Will consider position in the plumbing or heating field or state department of health. Prefers middle western or western states. E-453

Public Health Engineer, M.S. Harvard, experienced in public health and industrial hygiene, wishes position of better sort in public health engineering or industrial hygiene. E-470

Public Health Engineer, M.S. Harvard, with more than 10 years' experience including 5 years with state division of sanitation, is available. E-468

STATISTICAL

Public Health Statistician. Young man, M.S.P.H. Michigan, now employed as supervisor of state health project, experienced in medical research, epidemiology studies and vital statistics, seeks position in city or state health department in Midwest. S-458

Woman with academic, business and research experience in vital statistics seeks a position in the vital statistics division of a state or city health department, preferably as registrar. S-459